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MANUAL OF VETERINARY MEDICINE

MANUAL OF THE PRACTICE

OF

VETERINARY MEDICINE

BY

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SECOND EDITION

REVISED BY

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PREFACE TO THE SECOND EDITION

THE field of research amongst the diseases of animals is almost boundless, and the importance of their investigation beyond question, especially as many of them are communicable to man. Great strides have been made during the past few years, particularly from bacteriological and hygienic standpoints, the discoveries of the organisms of glanders, tuberculosis, swine-fever, anthrax, and black-quarter, the uses of mallein and tuberculin as diagnostic agents, and the successful employment of vaccination as a preventive against black-quarter, being practical evidences.

At the present time it would be quite impossible to include in any one volume of this size complete details of all the ailments to which the domesticated animals may be subject, but there is undoubtedly a want amongst students and practitioners of a comprehensive *résumé* to which they may refer, and it was on this account that I acceded with pleasure to revise 'Courtenay,' as for the student and young practitioner it contains much which is of sound practical value.

Its popularity amongst students, especially in America and Canada, has made it advisable that the original letter-press and general arrangement should be altered as little as possible, and these have not been touched except where modern progress has rendered such alteration absolutely necessary. If only in the smallest possible degree it helps forward the progress of veterinary science, the trouble taken by both author and reviser will be amply repaid.

F. HOBDAY.

KENSINGTON, LONDON,
October, 1902.

PREFACE TO THE FIRST EDITION

(ABRIDGED)

In offering this volume to the consideration of members of the Veterinary Profession, as well as to students and others who are interested in the study and advancement of the Veterinary Science, I feel it will suffice to say that I have endeavoured to the best of my ability to render the matter contained in the following pages of as great *practical* value as possible, to present in the most plain and concise manner the nature, causes, symptoms, and treatment of each disease in the form in which it most frequently occurs. I have also endeavoured to briefly describe the various conditions requiring surgical interference, as well as to point out the surgical operations required to be performed in such cases—the proper methods of operating and the indications, favourable or otherwise, to the performance of such operations.

I have closely adhered to the teachings of one of the most eminently practical veterinarians and thorough gentlemen whom it has ever been my good fortune to meet—Professor A. Smith, Principal of the Ontario Veterinary College. But in the few cases in which experience and recent revelations of science have led me to conclusions different to those arrived at by my former teacher, I have not hesitated to depart from those teachings.

I wish to express a hope that this work may be favourably received by all into whose hands it may find its way, and more particularly by my fellow-votaries of the science which I admire and love above all others.

F. C.

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ERRATA.

Page 524, line 22, *after* 'mares' *add, as footnote,* '*Journal of Comparative Pathology and Therapeutisc,* vol. xv., p. 55; *Veterinary Record,* vol. xii., p. 359, and vol. xiv., p. 306.'

Page 524, line 27 *for* 'Chartier's' *read* 'Charlier's.'

THE PRACTICE
OF
VETERINARY MEDICINE

INTRODUCTORY

FROM the earliest ages, animals as well as men have been treated for disease according to a mode more or less systematic.

We are told that the Egyptians were the first to understand the management of the horse; the Greeks obtained their knowledge of the horse from the Egyptians. Xenophon, Herodotus, Vegetius, etc., are all familiar names, Vegetius having been styled the 'Veterinary Hippocrates.'

The name 'veterinarian' is a very old one, and is a modification of the Latin word 'veterinarius.'

The early history of the veterinary art presents little worthy of notice; for hundreds of years the art languished, and very little progress was made.

During the sixteenth century the first decisive step in an upward direction was taken: the works of Vegetius, as well as many more which had long lain neglected and almost forgotten, were translated into the various European languages, and eagerly read by an appreciative people. In the year 1616 a work was published in Venice with many plates, showing that the structure of the horse was pretty well understood. France took the initiative step in the advancement of the veterinary art, being the first nation to accord to the profession its proper status, as well as the first nation to found a veterinary school, the Lyons Veterinary College being founded in 1762; the present Principal being Mons. A. Chauveau, whose name is a household word familiar to, and respected by, every veterinarian throughout the world. Four years later, in the year 1766, the Veterinary College at Alfort was opened. Both institutions have become very famous, and justly so, on account of the excellence and thoroughness of their teachings, and the additions to scientific knowledge given to the world thereby. The veterinary art had by this time emerged from the darkness and disadvantages which had for centuries threatened its extinction, was recognised and supported by the Government and the people, and stepping into its proper place, became recognised as one amongst the sciences. The people became fully conscious of the fact that the health and wealth of the nation very largely depended upon the character and proper observance of the teachings and theories promulgated by the veterinary colleges. From this time onward the rise and progress of the art was assured and steady; until at the present time it is recognised as one of the foremost and most important professions in all parts of the civilized world. In Britain, the art was longer buried in ignorance than in the other European countries; from time to time works of more or less excellence were published, which were received with varying degrees of favour.

During the reign of Queen Elizabeth, Blundeville translated some foreign works into English; these were followed by the writings of many others, the most notable of which were, perhaps, those of William Gibson, published during the last century. Among the more recent writers who deserve more than ordinary notice may be mentioned Blaine, Coleman, Youatt, Percivall, Gamgee, Williams, Fleming, Dun, Robertson, etc. As agriculture, etc., advanced, the people became anxious to educate veterinarians on scientific principles. The first attempt made by St. Bel to establish a veterinary college in England was a failure; he returned to France, but finally succeeded in founding a college in London. He died shortly afterwards, and was succeeded as Principal of the college by Blaine. There are two veterinary colleges in Edinburgh, one in Glasgow and one in Dublin.

The United States census for January, 1883, gave the number of domestic animals as follows: Horses, 10,000,000; cattle, 40,000,000; sheep, 35,000,000; swine, 34,000,000; a total of 119,000,000 animals, representing a money value of about two and a quarter billions of dollars. When this vast interest is taken into consideration, and while considerable progress has been made, it remains a matter of surprise that still greater strides have not been made in the advancement of veterinary knowledge on the American continent. Comparatively speaking, it may be said that the practice of veterinary medicine and surgery is in its infancy throughout Canada and the United States. A quarter of a century ago there was scarcely a city or town on the American continent that would give adequate support to a veterinary surgeon. Such a state of things cannot now be said to exist, as the people have been gradually learning to understand and appreciate the necessity for qualified practitioners, of whom, while not so numerous as in the older countries, there is at least no scarcity.

Several veterinary schools and colleges have at various times been founded in the United States and Canada; of these the American Veterinary College, New York City, Professor Liautard, Principal; the Montreal Veterinary College, Professor M'Eachran, Principal; and the Ontario Veterinary College, Toronto, of which Professor Smith is Principal, have been the most successful; the course of study, subjects taught, etc., being almost the same as in the English, Scotch and Irish colleges, but the course is not in all cases so long.

In the United States no protective measures have as yet been taken by the Government as regards the passage of laws favourable to the veterinary profession; in Canada the profession, being protected by proper legislation, stands upon a firm foundation, and is safe from quackish opposition, a recent law of Ontario making it an unlawful act for any person to assume the title of veterinary surgeon, or any abbreviation thereof, unless possessing a diploma of some recognised veterinary college, certifying that the holder thereof has passed the required examinations satisfactorily, and is competent to practise as a veterinary surgeon. In Great Britain it is only during the last few years that a similar Act has been in force.

CHAPTER I

Diseases of the Respiratory System

SIMPLE CATARRH

THE horse is more liable to, and suffers oftener from, catarrh of the nasal passages than any other class of animal. I believe he is even more susceptible to respiratory troubles than man himself. The question may be asked, Why is this so? The answer is as follows: The horse, owing to the extraordinary development of the velum pendulum palati, breathes only through the nostrils, the inspired air subsequently passing through the nasal chambers, which are of large size and lined throughout their extent by the Schneiderian or pituitary membrane, consequently a very large surface of mucous membrane is exposed to the various atmospheric influences which tend to produce disease.

One of the most common diseases of this system is catarrh (simple) or coryza, etc.

Definition.—Simple nasal catarrh may be defined to be a discharge due to some irritation of the mucous membrane lining the nostrils.

Cause.—Probably a specific organism aided by predisposing causes such as exposure to cold and dampness (and more especially if the system be debilitated), badly ventilated stables, impure air, etc. Foreign bodies such as dust, chaff, etc., may cause catarrh, and if the animal is neglected, the irritation is likely to extend to the throat, setting up laryngitis, or to the bronchial tubes, causing bronchitis, etc., or the whole of the mucous membrane of the respiratory system may become involved in a general inflammation. The disease is most frequently observed in young horses.

Symptoms.—Probably the first symptom noticed is that the animal is duller than usual, coat slightly staring, dry, and dusty-looking. Anorexia is usually observable, as is redness and dryness of the Schneiderian membrane. The circulation is affected considerably in some cases, very slightly in others. Usually about this stage the animal has a slight cough, which is easily excited by pressure over the region of the larynx; but we may have a well-marked case of simple catarrh without a cough. The discharge is from both nostrils in a large majority of cases; it is at first of a serous character, thin and watery; soon, however, becoming thicker and more abundant, and yellowish-white in appearance. There is often a discharge of tears, which may or may not be abundant. Respiration is not interfered with except in certain rare cases.

Simple catarrh undoubtedly constitutes a far more serious affection in the horse than it does in man. If an animal suffering with catarrh be put to work, the probabilities are that he will come in suffering from congestion of the lungs, and death may even ensue in a few hours. Simple catarrh usually runs a favourable course in from six to ten days.

Treatment is very simple, and usually satisfactory if adopted in time. Pure air is absolutely indispensable in the treatment of all affections of the respiratory system. The animal should be placed in a dry and well-ventilated loose-box; the body should be clothed judiciously, according to the season, flannel bandages should be placed upon the legs, and the diet should be tempting to the appetite, of a moderate quantity, and of an easily digestible and nourishing character. Mild diffusible stimulants and febrifuges are the medicinal agents indicated in the treatment of simple catarrh. An excellent draught is as follows: Spts. Æth. Nitrosi, ʒi.—ʒii.; Potassæ Nitr., ʒii.—ʒiii.; Aquæ, ad O.i., to be given once or twice a day; if necessary, continue its administration for three or four days. Sometimes the required effect will be produced by the administration of one or two doses. The use of the Æth. Nit. should cease when the pulse becomes fuller, but the Potassæ Nitr. may be persevered with. It is said that a pretty powerful opiate, as Opii Tr., ʒi.—ʒii., combined with Potassium Nitrate ʒi., Aquæ q. s., will often succeed in arresting the course of the disease, if administered at an early stage; but the above should never be given in any case where the disease is well developed.

Inhalations of steam are highly beneficial, relaxing the mucous membrane and relieving the nasal irritation. A close nose-bag should never be used, as the horse breathing only through his nostrils would have his life endangered, unless able to get a certain amount of pure air with the steam. If the cough be troublesome, or shows a tendency to become chronic, a stimulating liniment, as the ammonical liniment, or a mild blister, may be applied; and a bolus, composed of equal parts of Belladonna Ext., Camphoræ, and Ipecacuanha, may be given once a day until relieved. In this, as in all other respiratory affections, purgatives are totally inadmissible. Should constipation be present, as it usually is to a greater or less degree, order food of a laxative nature, as soft mashes, containing linseed meal; or the condition may be relieved by a mild oleaginous draught, as Ol. Lini., ʒviii.—ʒxii.; or enemas of warm water, with a little Sodium Chloride, may be given. If the nasal discharge becomes chronic, Potassium Iodide should be given night and mornnig in drachm doses, or Ferri Sulph., ʒii.—ʒiii., may be given twice or three times daily; the iron being also a valuable tonic. A favourite prescription in England is as follows: Ferri Sulph., ʒii.—ʒiii.; Gentian, ʒii.—ʒiv.; twice or three times a day. The nostrils should be sponged several times daily, the eyes should also be sponged gently if much inflamed or if discharging. A change of food often hastens recovery—green food is highly beneficial. If the animal has been fed on food of a stimulating character, it is good practice to give food of an opposite character for a few days, as bran mashes, etc., then gradually revert to the original method of feeding. Should recovery not progress in a satisfactory manner, or the debility be well marked after the acute symptoms have ceased, tonics, as iron, gentian, etc., should be given, and the animal should have the best of food, and pure water in liberal quantities.

Results.—A great many diseases may follow simple catarrh as a result of injudicious treatment, or treatment too long delayed; or may exist as complications. Some of the complications and results of this affection are as follows: pneumonia, pleurisy, pleuro-pneumonia, nasal gleet, laryngitis, pharyngitis, laryngo-pharyngitis, bronchitis, etc., each of which will meet with due consideration.

LARYNGITIS

Definition.—Laryngitis may be defined as an inflammatory disease of the larynx, the inflammation involving the mucous membrane only, in the greatest number of cases, but sometimes involving the soft tissues as well, the latter form being the most serious. Catarrhal laryngitis is that form in which the mucous membrane alone is inflamed.

Laryngitis is a very serious affection, and often terminates fatally, sometimes within a remarkably short space of time. In some cases a thickened condition of the mucous membrane is caused by a copious and rapid effusion into the submucous tissue, swelling is great, the laryngeal muscles are greatly interfered with, or cease to act altogether, the glottal opening becomes partially or wholly closed, and death takes place by suffocation.

Causes.—The various conditions causing laryngitis are about the same as those causing simple catarrh, *i.e.*, exposure to contagion, changes of temperature, and more particularly if sudden, draughts of cold air, balling with a stick, administration of irritant medicines, as ammonia, etc., not sufficiently diluted. The disease sometimes appears in an epizöotic form, most commonly occurring as an epizöotic during the spring or autumn months, this form very probably being due to organisms aided by atmospheric influences.

Symptoms.—Usually the first symptoms observed are dulness of the animal and difficulty in swallowing. When drinking, part of the water returns through the posterior nares into the nasal chambers, and out through the nostrils. The neck and head are held in a stiff position generally, with the nose elevated and poked out in an endeavour to bring the air-passages as nearly as possible on a line. There may be a flow of saliva from the mouth, as the throat irritation will cause the animal to move his tongue about, and thus increase or stimulate the flow of saliva. In most cases of laryngitis a rise in temperature is noticed. If the increase is well marked, it indicates the case to be a severe one. A cough is usually present, which changes in character as the disease increases or decreases in severity, at one time being hoarse and dry, at another time of the variety described as moist cough. Coughing is easily excited by pressure on the larynx, or by an attempt on the part of the animal to drink. The state of the circulation varies—in some cases strong, in other cases weak ; pulsations generally number from sixty to seventy beats per minute; tongue sticky, hot, and slightly furred; all the visible mucous membranes are reddened, and there is a more or less abundant flow of tears. The breathing may or may not be difficult, but is quickened in all cases. There may be a swelling of the limbs at a certain stage of the disease, and a discharge from the nostrils, which, if profuse and coming away freely, is to be regarded as a favourable sign, the thermometer at this time showing a decrease in the animal's temperature. In a case about to terminate fatally, the Schneiderian membrane assumes a livid hue, the pulse becomes rapid and weak, the extremities become deathly cold and œdematous, cold sweats bedew the body, rapid prostration of strength follows, and death soon takes place.

Treatment.—It is very important that the patient should have an abundance of pure air—should be placed in a dry and comfortable loose-box, thoroughly ventilated and free from draughts. Hand-rub the legs well, apply flannel bandages, and clothe the body according to the season. An abundance of pure cold water should be supplied, which (if the animal will take it) is valuable to allay fever. All medicine should be given in the drinking water, if the animal can be induced to take it in that manner; if he will not take the medicine in his drinking water, it may be given in a draught, using water as the vehicle for its administration. Great care must be exercised in the administration of a draught to an animal suffering from laryngitis, a cough, or any attempt at coughing, on the part of the patient being regarded as a signal to allow the head to descend. If the pulse is hard and full, a few doses of aconite (Fleming's tincture) may be given with beneficial results. Potassium chlorate as a gargle cools the mouth and refreshes the animal, and should be used often and freely. Potassium chlorate and nitrate may also be given dissolved in the drinking water. Oft-repeated and long-continued inhalations of steam are probably productive of greater good than any other remedial measure. The inhalations may be enhanced in value by the addition of some antiseptic or sedative drug, as creasote, eucalyptus, terebene, or opium, belladonna, etc.; and belladonna extract, in conjunction with ipecacuanha, in doses of a drachm each, may be given with benefit. Fomentations to the affected part, if continued for an hour or two, are productive of much relief, by relaxing and soothing the inflamed tissues. After fomenting, the parts should be rubbed gently until quite dry. The throat is now to be kept warm by the application of hot wool, retained in place by a bandage. In some cases hot poultices may be used. Bran, linseed, turnips, or bread may be used. A stimulating application, as the ammoniacal liniment, mustard, or even a slight blister, may be applied to the throat, always taking into consideration the season of the year and the condition of the patient. Medicines may be conveyed into the system in the form of an electuary, which the animal will readily take, a useful one being as follows: Tannin, ʒi.; Spts. Vini Gallici, ℥ii.—℥iii.; Mellis, ℥iii.—℥iv. In cases which, in spite of treatment, increase in severity, and death by suffocation is imminent, recourse must be had to the operation of **Tracheotomy** as a last resort. The incision should be made about on a level with the third and fourth tracheal rings. Some operators excise portions of two or more rings, leaving a circular opening into the trachea. There is no necessity for so doing, a simple incision completely severing two rings answering all practical purposes. The tracheotomy tube should be carefully inserted, and secured in place by a strap passing around the neck. The tube should be composed of some non-corrosive material, as nickel, silver, or vulcanite, and should be removed and well cleansed twice a day. Another and a very rare form of laryngitis is characterized by the formation of false membranes.

Results.—As results of laryngitis, we may have a thickened condition of the mucous membrane of the part, or atrophy of the laryngeal muscles, producing roaring, ulceration of the rima glottidis, and sundry abnormal growths and conditions, proving a constant source of irritation to the highly sensitive parts, and offering an explanation for the troublesome cough which in so many cases frequently exists for months after the acute symptoms of laryngitis have disappeared.

Thickening of the mucous membrane is to be treated by a course of potassium iodide internally, and frequent application of vesicants externally, into the composition of which it is recommended that a certain proportion of iodine, or potassium iodide, be allowed to enter. When it is suspected that the process of atrophy of the laryngeal muscles is going on, chlorate of potash should be given with the view of arresting the muscular degeneration. Nerve-stimulants may also be tried.

NASAL GLEET

This disease is also known as **Chronic Catarrh, Ozæna**, etc.

Definition.—A catarrhal disease, characterized by a persistent discharge from the nostrils. It may result, in some cases, from a subacute inflammation of the mucous membrane lining the nasal chambers, or it may involve the various sinuses of the head. Pus is formed, which undergoes various changes, according to the length of time it has existed; and it may be exceedingly fœtid, or, on the other hand, may be absolutely devoid of odour. In an old case of nasal gleet, where the bones have become involved in the destructive process, the odour is indescribably offensive, and much worse than the odour emitted by a case of glanders. (It should be borne in mind, however, that either disease may exist in a fully developed form without giving rise to any odour whatever.) In nasal gleet the turbinated bones often become affected, and may present a sarcomatous condition.

Causes.—Nasal gleet frequently exists as a sequel to a neglected case of simple catarrh. It is also due, in some cases, to long-continued exposure and neglect, the animal receiving an insufficient supply of nutritive food; a common practice among farmers being to allow an animal to run out all winter with very little, or perhaps no shelter, and no food, except that afforded by the straw-stack. Injury to the bones also is a frequent cause. It is not at all necessary that the bones should be fractured to produce nasal gleet; the animal may receive a blow, in consequence of which a small bloodvessel may be ruptured; a clot forms, acts as a foreign body, sets up an irritation which gradually spreads in all directions, until a well-marked case of nasal gleet is the result. The disease also exists in some cases as a symptom of carious teeth, wherein the caries has extended to and involved the osseous structures. Inspissated or dried pus, however small in quantity, by acting as an irritant foreign body, is also an occasional cause.

Symptoms.—All chronic nasal discharges should be regarded with suspicion, and should be given a careful examination to ascertain their nature, as most serious results would be likely to follow a mistaken diagnosis wherein a case of glanders was pronounced to be a case of nasal gleet. A good knowledge of anatomy is of the utmost importance in making the differential diagnosis. The nasal discharge, at first white, before long becomes yellow, and adheres rather tenaciously around the nostrils, but is often flaky and not so viscid as the discharge of glanders. The Schneiderian membrane is reddened at first, but soon takes on a livid hue, and may present an abraded surface, but no ulceration. In some cases the submaxillary glands are found to be slightly enlarged. Percussion over the region of the sinuses yields a dull, dead sound, instead of the resonant sound emitted on percussion of the parts when healthy. Slight enlargement of the affected sinuses may be observed. A large accumulation of pus will give rise to laboured respiration. The pus is exceedingly offensive in odour where the osseous structures are involved. Nasal gleet is not a contagious disease.

Treatment.—Isolation as a precautionary measure should be adopted; endeavour to find and remove the cause. The patient should be kept in well-ventilated quarters, and the diet should be of a highly nutritive character, and supplied in liberal quantities. The animal should be allowed to rest, or, at the most, do only light work. The bowels and kidneys are to be kept in as nearly a normal condition as possible, and good grooming is a matter of some importance. The nostrils should be kept clean by sponging. The medicinal agents indicated are those which tend to restrain undue activity of the mucous membrane, and at the same time exert a general tonic and alterative action. Ferri Sulphate is often productive of good results, as are the following: potassium iodide, copper sulphate, cantharides, the latter being given in doses of grs. v.—x. Frequent changes of medicines should be made; a combination of iodine and iron, forming iodide of iron, is probably the best agent known in the treatment of nasal gleet, to be given in doses of ʒi.—ʒii. twice a day; Ferri Sulph. ʒi.—ʒii., Acid. Arsen., grs. ii.—v. twice a day, is another prescription highly thought of. Strychnia or nux vomica may be substituted for the arsenious acid in the usual doses. In some cases counter-irritation (as a blister applied over the part) is attended with marked benefit; the nasal chambers may be injected with a weak solution of carbolic acid. There is also a very good instrument known as an insufflator now in use, by which the parts may be dusted with various agents in the form of an exceedingly fine powder. There is also a spray diffuser, by means of which various solutions may be beneficially employed. Various medicinal agents may also be employed in the form of vapour; the chief difficulty in the treatment of nasal gleet is the situation of the diseased structures, and their almost total inaccessibility. When the sinuses are filled with the accumulated pus, and the bones are involved, medicinal agents are useless, and the operation of **Trephining** must be performed to allow the escape of the pus. As a rule it is not difficult to trephine; in some cases the diseased bones are soft enough to admit of being cut with a knife. After trephining, the cavities should be syringed with a solution of carbolic acid in tepid water; give alteratives and tonics with a liberal diet, and generally a cure can be effected. In cases where the turbinated bones are affected, as a rule a cure cannot be accomplished. If the trouble is due to the presence of a carious tooth, it should be removed at once. There is a case on record where a carious tooth made its way into the frontal sinus. Hydrastis canadensis is very useful in some cases. Mallein may be used as a determining test as to whether the case is glanders; nasal gleet, if neglected, becomes in many cases an incurable disease.

Abscess of the Turbinated Bones.—This disease may cause nasal gleet.

Causes.—Abscess of the turbinated bones may be caused by injuries, presence of foreign bodies, etc.

Symptoms.—There will be a discharge of pus from the nostrils, which may be increased in quantity by elevating the head of the animal for a few moments, then suddenly depressing it.

Treatment.—Trephine, and allow what pus is present to escape, then remove all diseased bone* or touch with dilute hydrochloric acid; after-treatment should consist of antiseptic or astringent injections, varying the drugs from time to time at discretion. Acidum Hydrochlor. (one part to fifty of water) is an excellent application to diseased bone.

Thickening of Mucous Membrane lining the Nose.—*Causes.*—This condition sometimes occurs during debility, in advancing age, and after irritant or too powerful injections.

Symptoms.—A snuffling sound is heard during respiration, and there is usually some nasal discharge.

Treatment.—Difficult; give tonics internally, and astringent injections gradually increasing in strength.

Nasal Tumours, or Polypi.—These growths are usually of a fibrous character, and are characterized by a small pedicle or neck, with a free expanded extremity. Nasal polypi are of far more common occurrence in man than in our patients. These growths may exist high up or low down, and according to their situation they are visible or invisible. A polypus may exist, being invisible for a considerable length of time, and finally by increase in size become plainly visible to the examiner.

Causes.—These growths are often a sequel to irritation of the mucous membrane lining the parts, and frequently occur without any apparent cause for their presence.

Symptoms.—There is generally a discharge from the nostril on the affected side, the discharge sometimes being tinged with blood; a snuffling sound may be heard during respiration, the breathing being seriously interfered with at times, even to such an extent as to cause the animal to fall down.

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* The hæmorrhage which follows removal of the turbinated bones is often very difficult to stop and may even cause a fatal result.

Treatment.—If possible, seize the polypus close to the neck with the forceps and twist it off, or a fine ecraseur may be passed up the nostril, and the offending body removed this way.

Osseous Tumours.—Osseous tumours sometimes occur in the nasal cavities.

Symptoms.—Are those presented by the presence of any obstruction in the nasal cavities, as difficult breathing, etc.

Treatment.—Prompt removal of the offending growth, when accessible, is in all instances to be effected by means of the bone-saw and forceps.

Cysts.—In connection with the false nostrils, enlargements—erroneously described by some as tumours—are met with: they are rather small in size, and, if true, cysts usually contain sebaceous material.

Treatment.—The removal of these enlargements may be accomplished in a few cases by various applications; but the best ways are either to make an opening with a lancet, and allow the contents to escape, or to carefully dissect out the cyst wall and afterwards treat antiseptically.

Pharyngeal Polypi.—Polypi are occasionally met with in the pharynx, and usually have a constricted base.

Symptoms.—The irritation of the parts may possibly give rise to a slight discharge from the nostrils; the breathing is at times very difficult, and the animal will show symptoms of suffocation, will pull back on the halter, and perhaps fall, after which he may rise, breathe heavily, and be all right in a short time.

Treatment.—Examine the throat: the mouth speculum may advantageously be used in the examination. If the polypus has a broad base, it had better not be interfered with. If the base is constricted, you may cast the animal and remove it with the ecraseur. The hæmorrhage is often very excessive, and there is always danger of the blood escaping into the larynx, and thus finding its way into the lungs and causing death. It is very difficult to get at the part, and unless all the conditions, as age of the animal, etc., are favourable, an operation should only be attempted as a last resort.

Epistaxis: Bleeding from the Nose.—Bleeding from the nose may occur as a symptom of various diseases, as glanders, purpura hæmorrhagica, etc.; or it may occur as the result of an injury, as a blow, kick, etc., causing rupture of a bloodvessel in the nose. Nasal bloodvessels are also ruptured sometimes in consequence of severe exertion, and bleeding occurs now and then without any apparent cause. It is often difficult to arrest.

Symptoms.—A flow of blood, generally from one nostril only, but occasionally from both nostrils.

Treatment.—Astringent solutions may be forced into the nasal chambers. The various preparations of iron are useful; solutions of lead acetate, alum, etc., are also useful. In some persistent cases, plugging one nostril may have to be resorted to; cold water or ice may also be applied externally. A string should be attached to the plug, for the purpose of removing it when necessary.

HÆMOPTYSIS: HÆMORRHAGE FROM THE LUNGS

Hæmorrhage of the lung usually occurs in connection with, and as a symptom of, some diseased condition of the lung structure, as pulmonary congestion, etc. The primary cause in a great many cases is the performance of some severe exertion by the animal when not in suitable condition; most commonly met with in horses accustomed to fast work, as trotting and running horses; and a plethoric animal, on being put to a little extra exertion, will sometimes suffer from pulmonary hæmorrhage.

Symptoms.—The blood issues from both nostrils; coughing is present, showing laryngeal or tracheal irritation; respiration becomes quickened, and on auscultation over the region of the trachea, a peculiar rattling or gurgling sound is heard. This sound is caused by the air rushing through the obstructing blood and mucus; if the hæmorrhage is very considerable, there will be blanching of the visible mucous membranes and coldness of the extremities, whilst considerable weakness and dulness will be exhibited by the patient. Hæmorrhages may also take place from the trachea, bronchial tubes, etc.

Treatment.—The animal should be placed in a well-ventilated loose-box, any undue weakness should be combated by administration of stimulants—alcoholic stimulants being the best of all—the patient should be kept as quiet as possible and well clothed, the limbs should be well hand-rubbed, and then bandaged with flannel; refrigerant applications, as cold water or ice, may be applied to the sides of the chest. Medicinal remedies are those which tend to support the animal strength and combat the hæmorrhage; the latter are Ol. Terebinth, Plumbi Acetas, Opium, Acidum Gallic, Tinct. Ferri Perchloridi, etc., to be given in the usual doses as the exigencies of the case demand.

An animal, after having suffered from hæmoptysis, should be used very carefully, and not put to any great exertion for a long time afterwards.

ABNORMAL SOUNDS

High Blowing consists of a peculiarly loud, rushing noise caused in some horses during a gallop. It is due to some interference with the free ingress and egress of air. It may be very objectionable, but is not usually classed as an unsoundness.

Roaring may be defined as breathing with a loud and unnatural sound, the sound being emitted more particularly during the inspiratory act, and upon the animal being put to violent exertion. **Wheezing** and **whistling** are modifications of the same disorder, and both finally terminate in roaring.

Snuffling is a frequent accompaniment of catarrhal diseases, or where there is a nasal discharge, as in influenza, glanders, etc.

Snoring is symptomatic of some nasal obstruction, as a polypus, etc.; this sound also occurs as a symptom of brain disease.

Sneezing is indicative of an irritable condition of the nasal mucous membrane.

Grunting.—This sound is referable to the larynx, and may or may not be connected with disease; it usually accompanies roaring, and is always to be regarded with suspicion. Any painful disease may cause an animal to grunt, and some animals have an ugly habit of grunting without the presence of disease.

Cough may be defined to be a laryngeal sound, produced by the violent expulsion of air from the lungs.

Suppressed cough is the sound emitted by the animal when suffering from a disease in which the effort of coughing is accompanied by pain; this form of cough is pretty characteristic of pleurisy

Chronic cough frequently exists without any apparent cause; it also occurs as a sequel of laryngitis, and is sometimes associated with chest diseases, indigestion, derangement of the pneumogastric nerve, etc. Chronic cough is easily detected by a slight pressure of the larynx, and is usually of a hollow, dry sound.

Treatment.—Bad hay and oats, dusty food, etc., should be carefully avoided, and the following very simple, but nevertheless very good, remedy in some cases is worthy of a trial: Antimon. Tart. ʒi. twice a day for nine or ten days. Another old and powerful remedy, which was highly thought of by Professor Dick, is as follows: Hydrarg. Subchlor., Digitalis, Camphoræ, Opii Pulv. āā. ʒss.; to be given in a bolus every other morning before feeding.

Bronchocele.—Close to, and behind the larynx, is situated the thyroid gland. This gland frequently becomes hypertrophied, constituting an affection known as bronchocele. It seldom does any harm. The disease is said to be most common in limestone districts.

Treatment.—Applications frequently renewed of Unguentum Iodi, or Unguentum Iodi Comp., as follows, Potassium Iodid. ʒi., Iodum ʒi., Adeps ʒiv., are the most successful. The gland may be removed by excision, but the operation should not be resorted to in any but exceptional cases, and the two lobes should never be removed except as a last resort, because marasmus, ending in death, is the usual sequel.*

ROARING

This condition, which is a most serious one, may be defined as breathing with a loud and unnatural sound.

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* According to Chauveau ('Comparative Anatomy,' Fleming's translation), 'the successive or simultaneous excision of the two lobes in the horse does not appear to cause any derangement of the animal's health.' In the dog, however, the usual, if not certain, sequel is lassitude, rapid wasting, and death.

Properly speaking, roaring in itself is not a disease, but is a symptom of disease. The condition is due to paralysis of the vocal cords and atrophy of the dilator muscles of the larynx, the muscles affected being the crico-arytenoideus, posticus, and lateralis, the arytenoideus, and the thyro-arytenoideus.

A variety of causes have been assigned for roaring. Malformation of any of the air-passages, obstruction of the nasal cavities, occlusion of one of the nostrils, etc., will produce the sound; but in a pure case of advanced roaring the muscles above-mentioned are paralyzed, or atrophied, in consequence of which the laryngeal opening is not properly dilated, and the air rushing in during inspiration comes in contact with the loosely-flapping parts of the larynx, and produces the sound known as roaring. Roaring, from any cause whatever, constitutes an unsoundness.

Causes.—Any immediate irritation, as laryngitis, etc., by interfering with the nervous supply of the part, has a tendency to bring about the disease, by causing degeneration of the muscular fibre. Strangles involving the larynx is also sometimes followed by roaring. In many cases the disease may be traced to an hereditary predisposition on the part of the animal, certain strains of all breeds of horses being peculiarly liable to this disease. Conformation undoubtedly exerts a powerful influence in this direction. Animals having a long neck and narrow in the submaxillary space should always be regarded with suspicion; for although such an animal is not by any means necessarily a roarer, he is undoubtedly predisposed to the disease. Tight-reining may also be regarded as a fruitful cause of roaring. Another theory propounded recently is that the recurrent branch of the pneumogastric nerve, being influenced by the lymphatic glands, which lie in close proximity to its course, becomes irritated; irregular nervous action is the result, and the laryngeal muscles, on account of perverted nutrition, undergo fatty degeneration, or become wholly or partially paralyzed, in consequence of which the disorder known as roaring becomes established. When caused by strangles, it is generally due to the form known as 'irregular' or 'bastard.'

Symptoms.—It is chiefly when the animal is excited or sharply exercised that the sound is produced. In ordinary cases it is only during inspiration that the sound is made, but in bad cases the sound is emitted also during the performance of the expiratory act. A moderate canter is not always sufficient to expose the roarer. The proper way to examine for and discover roaring is as follows:

The animal should be made to attain as high a degree of excitement as possible, then should be galloped past the examiner at full speed, and preferably on an ascending grade. The animal, after one or two runs, may be pulled up short, close to the examiner, who, by immediately placing his ear to the nostrils and larynx of the animal, will be able to detect any abnormal sound. The above method of examination is to be recommended in all cases, as some cases of roaring are so slight as to be barely discoverable by the most severe tests. Another way to test an animal for roaring is as follows: Have the animal gently trotted, after which he is to be coughed, due observation being made of the character of the cough; after which the animal is to be placed by a wall, his head firmly held by the attendant. The examiner now makes a feint, as though going to strike the animal, which latter naturally starts forward very suddenly, and, if affected, will usually take a deep inspiration, and emit the grunt peculiar to roarers. But such a test cannot be regarded as an entirely satisfactory one. A case may occasionally be met with wherein the animal whistles slightly, the sound being due to a slightly thickened condition of the mucous membrane of the larynx, caused by an attack of laryngitis a month or so previously. This sound is evidence of unsoundness at the time it is present, but the animal may entirely recover in course of time; but in cases where the anatomical conformation of neck mentioned above is present, it is safe to say that the whistler will finally become a roarer. Paralysis of the vocal cords, giving rise to roaring well marked, is generally incurable.

Treatment.—Careful attention should be paid to the diet. The food should be of the best, and given in moderate quantities. Moderate exercise is beneficial. Counter-irritation, as a pretty strong vesicant to the throat, may be followed by a remission of the symptoms. Potassium iodide in doses of one drachm twice a day will sometimes effect a cure in recent cases, if slight. Another mode of treatment highly thought of and especially recommended by Mr. George Fleming, is the use of the galvanic battery, persevered in day after day until some improvement is perceived or the case is decided to be hopeless. At the same time nerve stimulants may be given internally, as in many cases the trouble is undoubtedly due to lack of proper nervous influence. Where such is suspected to be the case, nux vomica in drachm doses, or the alkaloid strychnia in doses of two grains, may be given a couple of times daily. A peculiarity of this disease is that it is nearly always the muscles of the left side which undergo the degenerative process; but disease causing roaring is essentially a disease of a progressive character, and sometimes it exists to such a degree in old cases, where probably the muscles of both sides are atrophied, that a trot of a hundred yards will cause the animal to stop and show symptoms of suffocation, as staggering and roaring, to an alarming degree. It is an act of mercy to destroy such an animal. However, the animal may be relieved by tracheotomy, and used for slow work, or arytenoidectomy may be performed.

TRACHITIS

Definition.—Inflammation of the mucous membrane lining the trachea.

Inflammation of the trachea is generally due to the presence of some foreign body, or exists as a complication of laryngitis, etc.

Symptoms.—The respiration is somewhat laboured, and on auscultation of the tracheal region a rattling sound may be plainly heard, except in the early stages; there is a nasal discharge which relieves the trouble considerably.

Treatment.—Clip the hair over the course of the trachea, and apply the ammoniacal liniment, or mustard; the latter being the best, as well as being a very safe application—in an hour or two it may be sponged off, especially if the horse becomes excited and irritable. Medicinal agents are Tr. Aconite, Potassium Chlorate, Potassium Nitrate, etc. Clothe the patient and keep out of draughts, and do not allow the animal to breathe very cold air.

Tracheotomy.—Sometimes, as a result of tracheotomy, there is noticed a growth of a cartilaginous nature around the opening.

Treatment.—Excise with scalpel and forceps, and if too far advanced, insert the tube lower down the trachea.

Emphysema.—I recollect Professor Smith, in one of his lectures, making mention of a case coming under his observation, in which a slight opening existed at the upper part of the trachea, or lower part of the larynx, in consequence of which, during expiration, the air escaped through the opening into the areolar tissue and caused great distension of the part, which, however, did not persist for any great length of time, the swelling subsiding in consequence of absorption of the air taking place, when the presence of the opening into the trachea could by means of the fingers be plainly distinguished through the intervening soft tissues.*

Treatment.—An incision should be made, cutting well down through the soft tissues until the abnormal opening lies fully exposed, after which a counter-irritant should be applied, and of a strength great enough to cause the exudation of material sufficient in quantity to close the opening.

Enlargements over the course of the trachea are sometimes met with, occurring with greatest frequency amongst colts.

Treatment consists in the free application of counter-irritants, preferably such as contain iodine, or surgical removal.

Thickening of the mucous membrane lining the trachea, constituting a chronic or simple inflammation of the trachea, sometimes occurs, giving rise to more or less difficult respiration, and perhaps a slight discharge from the nostrils.

Treatment consists in the application of counter-irritants over the course of the trachea, the Ungt. Hydrarg. Biniod. and the ordinary Ungt. Iodi being useful, in conjunction with the administration internally of potassium iodide, nitrates, etc.

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* A similar case came to the London College Clinique in 1899. The patient, a mare, had a history of having fallen with her neck on the edge of the pavement. The skin of the neck was very emphysematous, and a small hole in the trachea could be distinctly felt.

THE LUNGS

are those two spongy organs, one on either side, situated in the thoracic cavity, which are the essential organs of respiration, and are composed of: first, the pleura, the bronchial tubes and the parenchyma, or lung substance proper. The lungs serve for the purpose of purifying the blood. In examining as to the state of the lungs, there are various methods by which the presence of disease may be detected, the chief ones being auscultation, percussion and palpation.

Auscultation.—In health, on applying the ear to the sides of the thorax there may be heard a soft breezy sound, which is increased by excitement or exertion, and decreased by quietude; this may be called the vesicular murmur.

Percussion.—By percussion is understood striking upon the surface; the fingers, or an instrument known as a pleximeter, being used for the purpose. The healthy part will yield a resonant sound upon being struck, and the diseased part yields sounds of various kinds.

Palpation, or touching with the fingers. In some diseases (as pleurisy) pressure in the intercostal spaces causes pain.

We have bronchitis, pneumonia, pleurisy, etc., occurring in connection with the lungs. In very many diseases affecting the chest, the lungs, pleuri, bronchi, etc., become all more or less affected—*post-mortem* examinations prove this. In connection with the larger bronchial tubes we have a snoring sound in disease; this sound is known as the rhonchus râle.

Sibilus.—This sound may be described as a whistling sound, and, when present, indicates more or less irritation in connection with the smaller bronchial tubes; the sounds change more or less according to the nature and severity of the disease, and different sounds are produced during different stages of the same disease, as, for instance, during the first stage of bronchitis the sound may be dry, while during the latter stages, when the mucous membranes are actively discharging, the sound becomes moist.

CONGESTION OF THE LUNGS

The lungs are supplied with blood by two sets of bloodvessels, known as the nutritive and functional bloodvessels; the bronchial arteries and veins constitute the former, while the latter consists of the pulmonary arteries and veins, and is the system involved in congestion of the lungs.

Definition.—Congestion of the lungs may be defined as partial or complete arrest of the pulmonary circulation; a largely increased amount of blood is detained in the parts, causing an enlarged condition and functional derangement of the lungs. Congestion of the lungs is a forerunner of pneumonia and other pulmonary affections, or it may occur as an independent disease.

Causes.—Congestion of the lungs is very common at certain seasons of the year; in Canada the disease being of most frequent occurrence during the spring; the explanation being that on account of the length and severity of the winter season many horses are kept standing in the stable, fed well, and get no exercise; on the appearance of fine weather they are taken out, put to hard work, and congestion of the lungs is a frequent result. In England the disease is of frequent occurrence amongst hunting horses at the beginning of the hunting season, the horses being put to rapid work and severe exertion when not in fit condition. Driving an animal while suffering from an attack of simple catarrh, influenza, etc., quartering in damp, badly ventilated stables, impure air, draughts, etc., are all causes of congestion of the lungs. The condition occurs occasionally as a symptom of cardiac derangement, etc. The disease may, or may not, run a favourable course in a very short period; a horse may die in twenty-four hours from the time the first symptom was manifested. A very slight congestion is sufficient to cause death, providing a large portion of lung tissue is involved. The disease runs its course to a termination, favourable or otherwise, [illegible] in a period varying from eight or ten hours to several days.

Symptoms.—Symptoms vary to a greater or less extent, but I will describe a case as it occurs in the usual form as a result of ordinary causes. A horse suffering from catarrh has been driven, is rubbed over and put in the stable; he is observed to shiver, the body becomes very cold, in some cases the extremities also become deathly cold; all food is refused; on auscultation rhonchus râle is discovered; the mouth is hot, more or less constipation is observed, pulse sixty, seventy, or eighty beats per minute; as a rule the patient persists in retaining a standing position; in some exceptional cases, where tympanites occurs, the animal may lie down to relieve [illegible] intestinal pain; the breathing is quickened, and some [illegible] difficult in most cases.

A horse, after being driven a few miles, more especially if at a sharp pace, and the animal not in fit condition, will begin to lag, appears sluggish, the Schneiderian membrane is reddened, breathing becomes very difficult, the nostrils flap during respiration. This flapping of the nostrils is very characteristic, and is a valuable diagnostic symptom. Cold sweats bedew the body, and the body, ears, and extremities become deathly cold (in warm weather the coldness of the body, ears, and extremities is not so well marked as during cold weather); the ears flap, or droop; in some cases the pulse is indistinct, in other cases not so much so; the temperature gradually rises, there is trembling of the flanks, and on auscultation the characteristic sounds of congestion of the lungs are heard. Allow the animal to stand quietly in plenty of cool, fresh air and he will often recover; but drive him in this condition and death will result.

Treatment.—The treatment of congestion of the lungs is not at all difficult, and if proper, the result is usually satisfactory. The treatment should be energetic; whatever it is intended to do, should be done without loss of time. A diffusible stimulant should be given as soon as possible, as Spts. Æth. Nit., or Æth. Sulph., in doses of ℥i.—℥ii., the first named being the best; repeat the dose in a couple of hours, or until the pulse shows improvement, when the administration of stimulants should cease. Ammonia, ale, whisky, etc., are all highly useful stimulants, and may be given in the usual quantities. The body of the patient should be well clothed; the legs should be well hand-rubbed and bandaged with flannel bandages, or fomentations (the water being as warm as the animal can stand) to the legs, and continued for some time, are highly beneficial. Enemas containing a sufficient quantity of Ol. Terebinth. may be given with the two-fold object in view of clearing out the rectum, removing any hardened fæces it may contain, and at the same time producing a stimulant effect of a mild diffusible character. Cloths wrung out of hot water may be placed on the sides, or, in some cases, mustard is applied. It should be borne in mind that during all this time the animal should be kept in a well-ventilated loose-box, or other place where the free access of plenty of pure air would not be interfered with. After the most violent symptoms have subsided, Ol. Lini ℥vi.—℥viii. may be given if constipation is present; however, it is seldom needed. Venesection may be practised, and is of benefit in certain cases; four, five, or six quarts of blood being abstracted, to be followed in an hour or so by the administration of a diffusible stimulant. Arnica Tr., in doses of ℥i.—℥ii. is recommended by Williams. A little gentian may be added to either of the draughts above mentioned; a slightly stimulating embrocation applied to the extremities acts beneficially on account of its warmth-producing power. In cases where weakness and general debility are manifested after the acute symptoms have passed off, ale, whisky, æther, etc., with a little gentian, may be given daily until some improvement is observed; at the same time thorough grooming, regular exercise, and proper feeding are of the utmost importance. Bran, carrots, or anything the animal will eat, may be allowed in moderate quantities. In cases where the lungs become gangrenous, as they sometimes do within a surprisingly short time, the pulse becomes very weak and quick, the whole of the body surface becomes deathly cold; the animal persistently stands up, turns to the door, is of a listless appearance generally; the countenance has a haggard appearance. The respiration now is not attended with as much difficulty as in the earlier stages, the breath becomes fœtid, and death soon follows. Sometimes spasm of the diaphragm occurs in connection with a case of congestion of the lungs.

PNEUMONIA.

Definition.—Inflammation of the lung-substance. This condition is a frequent result of pulmonary congestion, and is often associated with other diseases, as pleurisy, bronchitis, etc. When pleurisy and pneumonia co-exist, the disease is termed pleuro-pneumonia. The symptoms of the above-named diseases do not differ very much, and the treatment for all is about the same. In pneumonia one or both lungs may be affected. When both lungs are involved in the inflammatory process, it is usually as a result of congestion, and death is a frequent termination. In most cases only one lung, or a portion of it, is involved. Pneumonia may be croupous, catarrhal, or interstitial.

Several changes take place during the progress of a case of pneumonia, which may be described as follows:

First stage is that of hyperæmia, characterized by an excess of blood in the part. As a usual thing exudation speedily follows, and solidification commences. The first stage may be called arterial injection, engorgement, or congestion, the first-named term being probably the best. If treatment can be commenced in this stage, the sequel is much more likely to be favourable.

2nd. 'Red hepatization' is the term applied to the second stage. At this time the lung-substance has undergone a more or less destructive process, and will readily sink on being placed in water, its weight having largely increased as the exudate became solidified. In case the patient recovers after the disease has attained this stage, the exudate is removed by the process of absorption, and the lung gradually regains its former condition. At this stage the lung, on being cut into, presents a much redder colour than that of the healthy lung.

3rd. 'Grey hepatization' is the term applied to the third stage of pneumonia, in contradistinction to 'red hepatization'; but the difference of colour is not always well marked. The change from red to grey hepatization is very gradual. The lung-tissue has no air in it, and sinks in water. When this stage is reached, death is the usual result. The diseased spot may be circumscribed, and not spread. This is particularly common in pleuro-pneumonia of the ox. The various stages are uncertain as to duration, engorgement in some cases lasting for a very brief period, and terminating in hepatization. Pneumonia may justly be described as a very insidious disease, frequently proceeding to a very great extent without showing many signs of its presence.

Causes.—Among the predisposing causes may be enumerated the following: exposure to cold and dampness, standing in a draught, neglected catarrh. An animal suffering from a case of simple catarrh, on being put to work, will often develop a case of pneumonia. It may occur as a result of some irritant substance, as medicine, gaining access to the lungs, inhalation of smoke, badly ventilated stables. It is now recognised that the true cause of the great majority of cases of pneumonia is an organism. Bacteriologists have on numerous occasions demonstrated a streptococcus to be present in the fluid in the lungs of horses and other animals which have died of pneumonia. Liguières, Schutz, and others have also found this organism. It is biologically identical with the streptococcus of strangles, and Liguières has asserted that it is the same organism ('Journal of Comparative Pathology and Therapeutics,' vol. xi., p. 328). It may occur as a result of contact with glanderous horses, and is then termed 'glanderous pneumonia.' Pneumonia is also sometimes a sequel to various respiratory diseases, as bronchitis, laryngitis, etc.

Symptoms.—The disease is ushered in by rigors, which are usually, but not always, well marked. Respiration is not affected to any great extent at first. Pulse quickened, varying from sixty to eighty beats per minute, and perhaps full. The mouth is hot, and has a peculiar feeling of stickiness; temperature becomes increased; all the visible mucous membranes are reddened, highly injected, and dry, indicating the presence of the febrile stage. Ears and legs are usually cold, but sometimes alternately hot and cold. Another characteristic of this disease is that the horse persistently retains the upright posture, while the ox as persistently remains in a recumbent position. There are exceptional cases, where the congestion is very severe or the pleura is affected, when he will lie down, but will rise almost immediately, not having found the expected relief. The animal will face the door so as to get the fresh air. The respirations are normally about ten per minute, but are increased in this trouble. Auscultation and percussion are material aids in diagnosis. The vesicular murmur is increased, giving rise to a sort of crepitating sound, which has been compared to the sound produced by rubbing a lock of hair between the fingers in close proximity to the ear. This sound is heard during the first stage or period of arterial injection, while the lung is still struggling to perform its functions. Soon a copious exudation takes place, which after awhile solidifies. This condition is denoted on auscultation by the absence of all sound in the diseased structure. In cases where the exudate breaks up, liquefaction beginning to take place, a sort of ringing sound may be heard on auscultation, showing that the tubes are regaining their former condition. Percussion over the region of a diseased lung yields a dull, dead sound ; a resonant sound being emitted if the structure is in a normal condition. The right lung is more likely to become affected, and, as a matter of fact, does more frequently become affected than the left lung. Fortunately the whole lung or both lungs are not often involved in the inflammatory process, or death would quickly ensue. Abdominal breathing may be observed ; appetite is poor or entirely absent. In certain cases, consolidation of the lung structure may occur within forty-eight hours from the appearance of the first symptom, but, as a rule, it takes longer. In cases likely to terminate fatally the pulse runs up, becoming quicker and weaker ; the respirations become increased in number, and more difficult. A very bad symptom, after a few days' illness, is flapping of the nostrils ; in such cases, usually in the course of four or five days, a brownish or rusty-coloured discharge may be observed flowing from the nostrils, the eyes take on an amaurotic stare, and the patient seems to be unconscious of everything going on around him. The pulse now becomes almost indistinct, body and extremities deathly cold, and the mouth somewhat cold, the patient may lie down for a few minutes, turn his head to his side, then get up, stagger, fall, and rise no more. The horse retains the standing posture in this disease because it affords greater relief than any other position. Death may ensue in from three to twenty days. In a case terminating favourably, a general remission of the symptoms is noticed, the pulse becomes slower and increased in volume, the animal temperature decreases, the appetite gradually returns, and by auscultation and percussion we are enabled to detect the various signs of improvement taking place within. Pneumonia is always a serious disease even if taken in time and treated properly.

Treatment.—Place the patient in a well-ventilated, dry loose-box, free from draughts. Pure air and pure cold water are essentials in the treatment of pneumonia. Blood-letting was at one time practised to a great extent, but the practitioners of to-day know better; it is safer, as a general thing, to make a judicious use of stimulants, but in those few and exceptional cases where a sedative is required Aconite Tr. (Fleming's), ♏ x., may be administered occasionally until the desired effect is produced. Another agent useful as a febrifuge and diuretic is potassium nitrate. It may be given in a draught or in the drinking water of the patient, if he will take it—about ʒvi. should be given in the course of twenty-four hours: it also exerts a beneficial action on the blood. When the circulation is weak, stimulants are indicated, as Liq. Ammon., Acet. with Spts. Etheris Nitrosi, etc., to be given in the usual quantities, and as often as occasion requires. The animal should be well clothed, according to the season of the year; the legs should be well hand-rubbed and bandaged with flannel; good nursing is indispensable and of the utmost importance; the appetite should be tempted by tit-bits, or the offer of relishable food in small quantities, and of a kind nutritious and easily digested. Bran-mashes do not amount to much in the way of nourishment, the percentage of nutritive material being too small. A small mash containing oats, or oats alone, boiled or raw, may be given if the animal will eat; great benefit accrues from giving roots, as carrots, etc. Very great harm is done by too frequent administration of draughts, as the stomach is very weak; and while the draughts should not be bulky, they should be composed of stimulants and nutritives in a concentrated form, as brandy, wine, milk, beef-tea, etc. All, or any combination of the above, may be placed in the drinking water, if he will take it that way, and he generally will. Counter-irritation is of the greatest benefit in pneumonia, if applied judiciously and the effect watched. Cloths wrung out of hot water, applied to the chest and covered with a dry cloth, are frequently of great benefit; but of course the nature of the application should depend upon the season or the state of the weather. Linseed poultices are good applications, and mustard applications are often of benefit. Whenever signs of amendment become apparent the excessive administration of medicines should be guarded against. Sometimes a pretty powerful sedative may be given to relieve the more distressing symptoms. If constipation is present, the action of the bowels should be solicited by frequent enemas of warm water; and during convalescence a laxative diet should be given; violent purgatives are absolutely forbidden, but magnesium sulphate is very useful on account of its laxative and febrifuge properties. Iodide of potassium may be given during convalescence, and colchicum is also useful. The hardy Canadian horses do not succumb to pneumonia as readily as the larger breeds, and stand antiphlogistic measures better. Pneumonia sometimes occurs as a result of influenza.

PLEURISY

Definition.—Inflammation of the pleura.

Pleurisy or pleuritis, as this disease is also sometimes termed, often exists in connection with pneumonia; nevertheless, it sometimes exists as an independent affection, as is often proved by the fact of an animal dying of effusion into the pleural cavity, and the lung-substance on examination being found to have undergone no change. Inflammation of a serous membrane, if extensive, constitutes a dangerous condition. There is a cavity known as the pleural cavity situated between, and formed by, the pleura pulmonalis and the pleura costalis; here, exuded from the two membranes, is a small quantity of fluid—serum—just sufficient being secreted to lubricate the parts and enable them to move smoothly. When the pleura becomes involved in the inflammatory process, serum ceases to be secreted, and dryness of the membrane takes place, giving rise to the grating or crepitating sound heard on auscultation. This condition soon passes off, and effusion into the pleural cavity and formation of fibrinous bands take place. The fibrinous bands may be found in from two to four days after the disease appears. In pleurisy a certain amount of effusion *invariably* takes place, and treatment is always directed with a view to preventing, if possible, the pouring out of a large quantity of fluid. When a copious flow takes place, it constitutes a condition known as hydrothorax.

Causes.—Pleurisy is caused by a specific organism, although it may be predisposed by alternations of temperature, exposure to cold and wet, and by the various conditions which cause pneumonia. During the prevalence of east winds in the old countries people and horses, as well as other animals, suffer from pleurisy.

Symptoms.—Like other chest diseases it is usually ushered in with a chill, which soon passes off. The pulse is wiry, the animal stands with his feet out, as in laminitis, and occasionally lies down, but only for a very short time; the animal shows evidence of great pain: he is suffering from what are known as cutting pains. On auscultation the crepitating sounds caused by the pleural membranes moving over each other can be heard; on coughing great pain is evinced, and the patient suppresses the cough as much as possible. This is called the suppressed cough; it is a characteristic of the disease, and is a valuable diagnostic symptom. The animal endeavours to keep the chest in a fixed position, and uses the abdominal muscles in the endeavour; this causes the formation of a well-marked ridge near the flank, easily seen in a gaunt horse. This is spoken of as the 'pleuritic' line or ridge. In many cases relief is apparently afforded, usually about the third or fourth day, but sometimes as early as twenty-four hours from the commencement of the attack. The animal now stands quietly, and seems to be free from pain; this is the sign that an effusion of serum has taken place; and as dryness of the pleural membranes has ceased, the acute pain has in consequence also abated. In cases where a very copious effusion of serum has taken place, the circulation is found to be greatly affected. In pleurisy, as in pneumonia, the patient stands with the elbows turned out; percussion, palpation, etc., give rise to considerable pain; the breathing is considerably interfered with, the respiration being short and difficult; a great amount of effusion may take place, rendering the case a hopeless one, without any very well marked symptom being observed.

Treatment.—Sedatives in a pure case of pleurisy can be pushed to a far greater extent than would be admissible in a case of pneumonia. Aconite may be given oftener, and in larger doses. If the pulse is full and bounding, febrifuges are indicated; and there are no better remedies than potassæ nitras and colchicum. If the pulse is weak, the use of stimulants is indicated: warmth should be applied to the sides in some manner. A very good way is to apply hot water; the body should be well clothed, and an anodyne liniment may be applied to the sides. If the pain seems to be very severe, it may be relieved by Opii Pulv. ʒi., or Opii Tr. ℥i., to be repeated in four or five hours. If the bowels are constipated, their action may be solicited by enemas frequently repeated; cathartics are neither good nor safe, as sometimes a quarter of an ounce of aloes will act with very great violence and cause bad results. In cases where something must be given to operate on the bowels, salts or oil may be administered. Febrifuges such as ether, nitre, quinine, etc., are useful in the early stages, as are also such stimulants and tonics as cinchona, brandy, camphor, etc. Potassium iodide will aid in the removal of effusion.

HYDROTHORAX

Definition.—An excessive effusion of serum into the cavity of the chest. This condition is a result of pleurisy, sometimes resulting from a very mild attack, and even in cases where every care is bestowed upon the animal. Hydrothorax often exists when the practitioner is called in for the first time.

Symptoms.—The symptoms are pretty plain. The respirations more or less difficult, short, and laboured, and of the variety known as abdominal. Flapping of the nostrils is a well-marked symptom. A peculiar glassy appearance of the eye is noticeable. The pulse weak and irregular, or intermittent. There is a heaving motion of the flanks, and regurgitation of blood in the jugular vein. On auscultation no sound can be detected in the inferior part of the thorax, but sounds are heard on proceeding higher up. In some cases, bulging of the intercostal spaces may be observed. The animal stands persistently, and soon œdematous swellings appear in the limbs, and extend along the belly. The case may linger for weeks, but if the cavity is one-half or two-thirds full of water, death is the usual termination. Perhaps several gallons of fluid will collect in the course of a few days—say, from four to ten days—and by pressing upon and interfering with the action of the lungs, seriously interferes with respiration. In cases where copious effusion has taken place, the fluid freely passes from one side of the cavity to the other, there being free communication between the sides, except when closed by bands of lymph.

Treatment.—The effused fluid may be got rid of by absorption, or by the operation of paracentesis thoracis. Absorption of the fluid, however, is the best mode of removal, and may often be effected by allowing the animal plenty of good nutritious food, at the same time administering diuretics, as colchicum, potassium nitrate, etc., with tonics, nutritives, and stimulants, as alcoholic liquors, port or sherry wine, champagne, eggs, milk, etc. The system should be supported as well as possible, and frequently the fluid will be absorbed and the parts restored to nearly their normal condition.

Paracentesis Thoracis.—In all cases where the process of absorption fails to take place, the above-named operation is to be performed, the space between the eighth and ninth ribs being the place usually selected. The skin is shaved, cleansed, and rendered aseptic, and the trocar or aspirator is boiled before being used to draw off the fluid. The operation is not so frequently successful among our patients as it is in the human family. It may be that the operation is not performed early enough in a great many cases. It is not at all necessary to draw off the whole of the fluid, but just enough to relieve the pressure on the lungs may be taken away. The wound is afterwards dried and treated antiseptically, or merely coated with Iodoform and Collodion (1—10) or Orthoform and Collodion (1—8). The after-treatment consists in good feeding, administration of stimulants and tonics, and supporting the strength by every possible means at command.

PLEURODYNIA

Definition.—A rheumatic inflammation of the walls of the thorax. This condition is sometimes mistaken for pleurisy.

Causes.—Exposure to cold and wet, and more particularly if the animal be debilitated from previous disease, etc.

Symptoms.—The symptoms are very similar to those of pleurisy. The animal appears to be in great pain; respirations are short and painful; pressure on the intercostal spaces causes the patient to grunt, and evidently produces greater pain than would follow a similar proceeding in pleurisy. One or both sides may be affected. Some writers say that the left side is affected oftener than the right. The circulation is not affected, the pulse being in a normal condition. Auscultation reveals no evidence of internal disease, the sounds being of a normal character.

Treatment.—Hot applications to the sides of the thorax are good, as hot water, or cloths wrung out of hot water; counter-irritation, or anodyne applications, as camphor and opium or belladonna liniment, may be employed, to which turpentine, if desired, may be added. Salicylate of soda, magnesium sulphate, or colchicum are to be administered internally.

BRONCHITIS

Definition.—Bronchitis may be defined to be an inflammation of the mucous membrane lining the bronchial tubes; it is sometimes called catarrhal bronchitis. According to whether it attacks the large or small bronchial tubes, is the danger great or small. Bronchitis often occurs in conjunction with pneumonia; there is first heat, and dryness of the mucous membrane, after which an exudate is poured out, which if in the small tubes clogs them up and produces death; but if the large tubes alone are affected, much danger need not be apprehended. Expectoration does not take place well in our patients. Bronchitis is variously described as acute and chronic—terms which explain themselves; capillary bronchitis, when affecting the smaller tubes; mechanical bronchitis, when caused by the presence of a foreign body, inhalation of smoke, etc. The above are the forms of bronchitis as ordinarily met with. There is also a variety of bronchitis due to a parasite; this is known as parasitic bronchitis.

Causes.—The disease may be caused by exposure to cold and wet, extremes of heat and cold, sudden variations of temperature, standing in draughts of cold air, improper administration of medicines—as forcing it down, or giving a draught through the nose, a part passing into the trachea, thence to the bronchial tubes, causing inflammation. A draught should never be administered through the nose. Bronchitis also sometimes supervenes upon an attack of acute indigestion, wherein the animal regurgitates the food, and a small portion of it escaping into the trachea, finds its way to the bronchial tubes, and sets up mechanical bronchitis. This form oftenest affects the right side on account of the anatomical conformation of the parts.

Symptoms.—The disease begins with a chill more or less marked; this is quickly followed by febrile symptoms. There is a husky, somewhat dry cough, disturbed respiration; the standing posture is retained; pulse soft and quickened, and coldness of the extremities. On auscultation, rhonchus may be heard, indicating that the large tubes are affected; or sibilus may be heard, showing that the small tubes are affected. Soon there is a discharge from the nose, which, if yellow, may be received as a favourable omen; however, if the nasal defluxion be of a reddish or rusty hue, it is to be regarded as an unfavourable symptom. The bowels may be constipated, and in the early stages the urine may be scanty, and of a colour somewhat higher than in health.

Treatment.—The patient is to be placed in a comfortable loose-box, well ventilated, dry, and free from draughts. Bathe the nostrils. Medicated inhalations,* or simple inhalations of vapour or steam, act beneficially by relaxing and soothing the inflamed tissues, and promote the mucous discharge. Counter-irritation also is productive of much good. In some cases sedatives may be given; such cases, however, are rare. The limbs are to be hand-rubbed and bandaged, and the body judiciously clothed. Constipation, if present, is to be overcome by clysters. Where the cough is very distressing, camphor, belladonna, and digitalis may be given. In the primary stage of bronchitis (catarrhal form), a strong opiate, as Opii Tr. ℥i.—℥ii., or Opii Pulv. ʒi., will often succeed in cutting the disease short. Subcutaneous injections of morphia are given by some practitioners, but it is not a commendable practice. Aloes should not be given in bronchitis. Ol. Lini ℥viii. may be administered in certain

* Sanitas, eucalyptus, terebene, creosote or carbolic acid.

cases. The debility which is always present, generally to a remarkable degree in bronchitis, is to be combated by the judicious use of stimulants, and during the period of convalescence tonics may very properly be given, along with a proper quantity of nourishing and easily digested food. Good grooming and exercise, well regulated as to kind and quantity, will usually complete the cure.

Results.—Bronchitis may result in a variety of ways, terminating sometimes in pneumonia, chronic bronchitis (thick wind, as it is called in some of the older works), and now and then a case of laminitis follows bronchitis. This is another reason why aloes should not be used in the treatment of this disease. Bronchitis may also terminate in death or recovery more or less complete, the parts frequently regaining their normal conditions of health and function, and seeming in no wise impaired by the process passed through. Often, however, the trouble reoccurs at a future date.

PULMONARY EMPHYSEMA

Synonyms.—Asthma, broken-wind, heaves, etc.

Definition.—A disease of a non-inflammatory character, characterized by difficult and peculiar respiration, and the presence of a prolonged and deep cough, known as the broken-winded cough.

Pathology.—The pathology of broken-wind is not as yet fully understood, being more or less hidden in obscurity, the theories regarding it being many and speculative. On making post-mortem examinations of broken-winded patients it is usual to find emphysema of the lungs. The emphysematous condition, however, is the result, and not the cause, of the disease. The trouble, in all probability, originates in the digestive system, from the use of bad food, or other causes; the digestive organs become deranged, causing indigestion and irritation of the pneumogastric nerves, which send branches to the lungs. The perverted nervous influence, thus reaching the lungs, causes spasmodic contraction of the muscular tissue of the air-cells, followed as a matter of course by a decrease in size of the cell itself. This condition is followed in course of time by dilatation and rupture of the air-cells, constituting pulmonary emphysema. There may be a few cases in which the lesion of the pneumogastric nerve occurs as a result of pneumonia, bronchitis, etc.

Causes.—Broken-wind, as before stated, may be caused by injudicious feeding, by a supply of bad food, or by bulky or dusty food of any kind, as clover hay, the stomach being kept in a state of distension. Cold may also exert a certain amount of influence in the production of broken-wind—allowing an animal to run out all winter, exposed to cold and wet, and feeding on coarse, bulky, innutritious food, as straw, etc. Severe exertion when the stomach and bowels are full has a tendency to cause broken-wind; however, if the system is in good condition, severe exertion will not produce it. Debility and fatness aggravate the symptoms.

Symptoms.—The breathing is interfered with, and is quickened; slight heaving of the flanks can be noticed, even when the animal is standing quietly, but this is much more noticeable after exertion. The breathing is peculiar, inasmuch as the inspiratory act is regular and performed smoothly and easily, while expiration is difficult, and is accomplished in a more or less violent manner, and by a sort of double effort, giving rise to the peculiar bellows-like movement of the flanks. Another well-marked symptom which is always present, and constitutes a valuable diagnostic test of broken-wind, is a loud, prolonged, very deep, and sonorous cough. When an animal coughs two or three times every morning for several months, it is to be regarded as a suspicious case, and one liable to degenerate into a case of broken-wind. Horses affected with this disease are, as a rule, ravenous feeders, and are in many cases possessed of deep and pendulous bellies, and are frequently troubled with flatulency. It is not so very long ago that an artificial anus was recommended for the purpose of getting rid of the flatus. Under certain circumstances, all of the above symptoms may become aggravated and increased in intensity. Frequently a broken-winded mare will fail to breed. Cases very much resembling pneumonia have occasionally come under observation. This form is to be met with in pregnant mares, and is doubtless caused by pressure of the fœtus upon the respiratory organs; but the pulse and cough will undeceive.

Treatment.--If it is a well-marked case, a cure cannot be performed; but even the worst cases of broken-wind may be benefited. The animal is to be carefully dieted, the food being of little bulk, clear, and absolutely free from dust. Pure water, as well as food, is to be given in well-regulated quantities. Distressing symptoms may be relieved by giving a laxative, followed by sedatives, as Hydrarg. Subchlor., Camphoræ, Opii Pulv., Digitalis. āā. ʒss., a couple of times a day. The use of the following is also attended with benefit: Acid. Arsen., grs. ii.: Ferri Sulph., ʒi. Nerve stimulants, as strychnia or nux vomica in the usual doses, are also of use. The hay should be free from dust and damped; clean straw is far preferable to dusty hay. Aqua Calcis, in conjunction with Ol. Lini, may be given as being antacid and laxative; Antim. Tart. is very useful in many cases. But medicinal agents will do no good whatever unless assisted by a rigid adherence to the regulations as to diet, etc., as above set forth. If the disease is taken in time and properly treated, a cure can in many cases be effected. Dick's prescription is the leading one, and probably the best. In the treatment of broken-wind, Potassium Bicarb. and Arsenic are sometimes given in combination. Fowler's solution is also used.

A horse possessing a round chest and largely developed organs of digestion is more liable to become broken-winded than a horse of different conformation. Unscrupulous dealers frequently administer lead pellets, large doses of oil, etc., which, by acting mechanically, relieve the symptoms for the time being, and enable the owner to sell the animal. An animal is often kept short of food, the same purpose, that of deception, being thereby effected. All suspected animals should be allowed to stand quietly all night, heavily fed and watered on the following morning, when by sharp exercise the fraud may be readily exposed.

Spasm of the Diaphragm.—This condition necessarily interferes with respiration to a considerable extent, and is sometimes mistaken for palpitation of the heart.

Causes.—Slight or severe exertion will cause it, if the animal is not in a fit condition. The most common cause is violent exertion; consequently the condition is of most frequent occurrence among horses of fast work, as trotters and runners. Driving an animal for several miles pretty freely will also cause it; and more especially if the animal is debilitated or out of condition.

Symptoms.—The symptoms of spasm of the diaphragm are most alarming. Respiration is difficult; a thumping sound is heard, but posterior to the region of the heart, and more violent and severe than palpitation; flapping of the nostrils, and perhaps apparent distress; but pulse and temperature usually normal. The symptoms often disappear as suddenly as they commenced.

Treatment.—This is much the same as in colic. Give stimulants or opiates in the usual quantities; clothe the patient; give enemas, with Ol. Terebinth. After having suffered once, a horse is more liable to subsequent attacks than an animal that has never suffered. To prevent, endeavour to improve his condition.

Rupture of the Diaphragm.—This lesion may occur without producing immediate death of the animal.

Causes.—Rupture of the diaphragm occurs from accidents or as a result of acute indigestion; the stomach and bowels become distended with gas, press upon the diaphragm, and when a paroxysm seizes the animal, causing him to throw himself violently about, rupture takes place. It may also be caused by putting the animal to violent exertion immediately after a full meal.

Symptoms.—The condition is very difficult, or almost impossible, to diagnose. Cases are related in which symptoms of great pain were manifested, and in which frothy spume and bubbles issued from the nostrils.

Post-mortem.—If well-marked extravasation of blood is found to have taken place, it is to be received as evidence that rupture of the diaphragm took place prior to death; in the absence of any extravasation of blood, we may conclude that rupture occurred subsequent to death.

Treatment.—Rupture of the diaphragm admits of no treatment whatever.

PLEURO-PNEUMONIA

Definition.—This disease may be defined to be an inflammation of the pleura and lung-substance.

The disease occurs in an epizöotic form, and is considered to be contagious, or non-contagious, according to the circumstances under which it occurs. According to Professor

Williams, the disease has also been called 'typhoid-pneumonia,' a name, however, which cannot be regarded as a very suitable one.

Strictly speaking, the form of pleuro-pneumonia affecting the horse as it occurs in Great Britain is rarely seen on the American continent.

Causes.—The cause of pneumonia is a specific organism, and the predisposing causes are exposure to contagion and a debilitated state of the system.

Symptoms.—Usually the first symptom to attract observation is a slight dulness, which becomes better marked as the disease progresses; the appetite fails, and the patient retains the standing posture. The extremities are alternately hot and cold. Cough, abdominal breathing, great debility, and a quick pulse are present.

Treatment.—Treatment should consist in allowing the animal complete rest, clothing the body, stimulating applications to the sides of the thorax, and the administration of stimulants and febrifuges, as ether, aromatic spirits of ammonia, carbonate of ammonia, etc. The patient's strength should be supported by the administration of milk and eggs, stimulants, etc. Sedatives are inad[illegible].

CHAPTER II

RESPIRATORY DISEASES OF THE OX

Catarrh.—This affection, while not so frequently occurring amongst cattle as in the horse family, is at the same time a very common disease. It consists of an irritation, or inflammatory condition of the mucous membrane lining the nasal cavities. If the case be allowed to continue, or be neglected, or improperly treated, the inflammatory condition will extend and result in bronchitis, etc. One reason why it is not so common amongst cattle as amongst horses is that cattle stand foul air and confinement, poor food, etc., much better than the horse does.

Causes.—The causes of catarrh in the ox are similar to those producing the disease in the horse, and it must not be forgotten that most of the catarrhs are contagious.

Symptoms.—The disease is ushered in with a chill, the muzzle is dry and hot, horns may be cold or hot, weeping of the eyes, back arched, mouth hot; soon there is a nasal discharge, and other symptoms similar to those of the same disease in the horse.

Treatment.—Laxatives may safely be administered to the ox in this affection, and undue constipation may be overcome by their use. Clysters may also be used to good advantage. The nose should be kept clean by bathing or sponging with disinfectant solutions. Stimulants, as nitrous ether, ammonia, etc., should be given. The animal should be housed in warm, dry, comfortable quarters, etc., the treatment being about the same as that employed for the horse.

Catarrh also occurs in a malignant or chronic form, and is then known as **Malignant Catarrh**. It is caused by bad feeding, debility, etc., and shows a great tendency to extend up into the sinuses, which are of great size in the ox, running up and extending into the flints or external orbital processes, and up to the frontal crest.

Symptoms.—The symptoms vary in accordance with the part or parts affected. There is a nasal discharge. When the external orbital process is affected, the head is carried on one side; on tapping the root of the horn, pain is evinced; a bulging out may also be observed at the root of the horn, or there may be a bulging of the sinus.

Treatment.—Trephine at the root of the horn, and allow the contained pus to escape, and it may be necessary to remove the horn in cases where it is diseased to a considerable extent. This disease is what gave rise to the imaginary disease of hollow horn, which exists only in the imagination of ignorant people. As a matter of fact the horn is always hollow, and the older the animal becomes, the more the hollow within the horn increases in size. After trephining, inject and keep the diseased parts clean, using tepid water for the purpose. Tonics and stimulants, with a nourishing diet, good nursing, etc., will usually complete the cure. Occasionally as much as a quart of fœtid pus may be contained within the sinuses. The patient should always be isolated upon the first appearance of the symptoms.

Laryngitis. — This disease, as it occurs amongst cattle, is about the same as in the horse, and presents about the same symptoms, and requires the same treatment, except that medicinal agents are to be administered in slightly larger doses; the counter-irritants, to take effect on the thick skin of the ox, must be made considerably stronger than those prescribed for the horse.

Pharyngitis. — This disease seldom exists as an independent affection, being usually associated with laryngitis, constituting laryngo-pharyngitis. Cause, symptoms, and treatment, about the same as above recommended for laryngitis.

Bronchitis. — Inflammation of the mucous membrane lining the bronchial tubes.

Causes.—Exposure to cold, inhalations of smoke, etc.

Symptoms.—Wheezing, difficult breathing, husky cough, hide-bound, staring coat, accelerated pulse, generally lies down, etc.

Treatment.—Place in a warm, well-ventilated place. The treatment must be on similar lines to that already described for the horse. Clothe the body, use counter-irritants, and nurse well.

PLEURO-PNEUMONIA CONTAGIOSA

This disease exists to a certain extent in several of the Eastern States of America, [illegible] New York, New Jersey, Delaware, Maryland, [illegible], and in the neighbourhood of the city of [illegible]; it has prevailed more particularly about Long Island, and has recently been reported to exist in Ohio, Kentucky, and Tennessee; but is unknown in the far Western States of America, or in the Dominion of Canada. [illegible] long prevailed in Eastern countries, and [illegible] losses upon the people of those countries. Pleuro-pneumonia has been known in Central Europe for more than two hundred years, but was confined to one part for a long period. War, however, occurring, caused it to become pretty widely spread; and owing to the increase of commerce and traffic it has since become spread far and near throughout the countries of the earth. It invaded Russia and Holland in the year 1802; Prussia, in 1824; England, in 1841, where it has never since ceased to exist to a greater or less extent. This disease was first recognised in Australia and the United States in the year 1843.

Definition.—Pleuro-pneumonia Contagiosa is a contagious disease of a specific character peculiar to the bovine race, and may occur in an acute, or in a sub-acute form. It is of a very insidious character: whole herds frequently becoming affected before the presence of disease is recognised. Some of our best authorities consider it as a fever, which tends to localize itself in the lungs, causing in those organs the well marked changes of effusion, inflammation of the lungs and pleura, solidification of the lung tissue, and gangrene.

Causes.—Contagious pleuro-pneumonia is due to contagion in every case, the contagious principle being supposed to gain access to the system by means of the organs of respiration. As a proof of this, portions of diseased lung etc., have been administered to healthy animals without producing the disease. It is sometimes a matter of difficulty to trace the disease to a contagious origin, but unquestionably a specific organism is at the bottom of the mischief. By the employment of radical methods of slaughter and veterinary inspection, Sir George Brown, the Chief Veterinary Adviser to the Board of Agriculture, has completely stamped the disease out of Great Britain.

Symptoms.—The first stage may continue during a period varying from two to eight weeks, the first symptom being an increase of temperature. This is succeeded by anorexia, and derangement of the circulatory system, the pulsations increasing in number. There is a short, weak, and husky cough, which is very characteristic of the disease, and is easily recognised by those of considerable experience. If in a cow, there is observed to be a considerable decrease in the quantity of milk secreted. The animal is hide-bound, the coat being unthrifty in appearance, and a gradual reduction of flesh takes place. Auscultation reveals a grating sound. The animal may now show signs of improvement and ultimately recover, or the disease may proceed to the second stage, the pulse becoming quicker and weaker, the muzzle hot and dry. No sound is heard on auscultation. The animal may assume the standing or a recumbent posture. If the latter, he lies pretty well upon the sternum. Rigors are observable, and soon a peculiar grunt is heard during expiration. Rumination entirely ceases, and a slightly tympanitic condition may occur. In some cases there is an offensive diarrhœa, grating of the teeth, gangrene of the lungs, and death. Young animals are more subject to the disease than old animals.

Post-mortem.—On a post-mortem examination, the interlobular tissue is found to be principally involved. Exudation and hepatization have taken place. The lungs have become consolidated and very heavy (much heavier than they become in the sporadic form), and will sink on being placed in water. The lungs present a peculiar marbled appearance. This appearance also occurs in the sporadic form, but not nearly to the same extent. The pleura is also involved, and effusion of serum into the pleural cavity has taken place. A circumscribed portion of lung may be found dead and encysted, having been in that condition perhaps for a year, or several years, and the animal at the same time remain in pretty good condition. The affected structure is very friable, and is easily broken down with the fingers. Softening of the lung tissue is sometimes found, even proceeding to suppuration more or less extensive. The contagion may be distributed throughout a whole building, or through the atmosphere in the same manner as small-pox. It is said to be most powerful during the first, or febrile stage of the disease. Stables are not safe to put healthy cattle in for several months after being occupied by diseased animals. The disease has been produced in healthy animals by allowing them to run upon pastures three months after diseased cattle have ceased to occupy them. Hay soiled by infected animals has also produced the disease three months afterwards. The incubatory stage of pleuro-pneumonia is from fifty to sixty days in duration. The loss by death among affected animals varies from thirty to eighty per cent., and those animals recovering are considerably depreciated in value. The use of the flesh of an infected animal as human food does not appear to exert any prejudicial effect whatever; at the same time, its use as human food is not to be recommended. The disease is spread in various ways, as by trains, boats, etc. In England the disease is now unknown, whilst in Holland there is a yearly loss of about fifty thousand cattle. Animals that have suffered and recovered are free from a second attack, according to all the recorded observations on this point.

Treatment.—As treatment is not advisable, prophylactic measures alone will be referred to. As soon as the presence of pleuro-pneumonia is detected, the diseased animal, or herd of animals, should be strictly isolated from all other cattle. The only proper method of dealing with pleuro-pneumonia consists in stamping out the disease by a system of extermination. It has been estimated by an eminent authority that the American Government could effect this object in the United States in the course of a year at a cost of about fifteen million dollars, the chief difficulty being that the various State laws interfere with this object, as they conflict with each other; and the eradication of pleuro-pneumonia can never be effected until the importance of such an object is recognised by the national Government and is made a national affair.

Inoculation.—This has been practised for a number of years, some experiments being practised twenty-five or thirty years ago, but not with much success. The subject of inoculation has, however, been revived and recently placed before the profession in a prominent light by Rutherford of Edinburgh, who regards the disease as an eruptive fever, with a tendency to localize itself in the lungs. Inoculation does not produce the disease, but produces a fever which is easily overcome, after which the animal is safe from pleuro-pneumonia. The animal may be inoculated at any season, but the most suitable time is during the months of June, July, or August. The method of inoculation is as follows. The virus is obtained from an animal that has recently died of the disease. A small opening being made into the diseased lung, lymph exudes into the cavity. This lymph, which should be perfectly liquid, clear, and free from frothiness or viscidity, contains the contagious principle in a well-marked degree. The hair is to be clipped from the tail of the animal to be inoculated for a space of about four inches, after which a seton needle is to be inserted beneath the skin, under which it is to be passed along for a distance of three or four inches, then out, having drawn after it a piece of worsted thread saturated with the diseased lymph or virus mentioned above. About the third or fourth day afterwards there is observed irritation of the part, and swelling in a well-marked degree. About the ninth or tenth day the temperature is heightened, and, if a milch cow, the secretion of milk becomes impaired. Some of the untoward results of inoculation are death (which occurs in a very small percentage, about two per cent. of the inoculated animals dying) and loss of a portion of the tail.

Pleuro-pneumonia Sporadic.—This form of pleuro-pneumonia is caused by parasites, draughts, exposure to cold and wet, sudden changes of temperature, foul air, or some such mechanical irritation. Medicine going the wrong way is a frequent cause.

Symptoms.—There is an increase in the number of respirations, which are also more difficult than usual; the pulse becomes quickened. The animal stands a portion of the time; when lying down, rests well upon the sternum. The temperature becomes elevated; dryness of the mucous membrane lining the nose is observable. During the early stages, muzzle hot and dry. Soon there is observed a nasal discharge. Percussion, while of some assistance in arriving at a diagnosis of disease in the ox, is not nearly so great an aid as when employed in the diagnosis of equine ailments. A better marked râle, however, is found in the ox than in the horse.

Treatment.—Counter-irritation, as an adjunct in the treatment of this disease, cannot be too highly spoken of. Large doses of purgative medicines are to be avoided. If constipated, the action of the bowels should be solicited by clysters, or a mild aperient draught. The rest of the treatment is the same as recommended for the horse.

'FILARIA BRONCHIALIS'—HUSK—HOOSE—PHTHISIS VERMINALIS—PARASITIC BRONCHITIS, Etc.

The above are a few of the names applied to a parasitic disease affecting sheep and cattle. The parasite usually found causing the disease in cattle is known as the strongylus micrurus, whilst in sheep the strongylus micrurus and the strongylus filaria are both found; young animals are more susceptible, and suffer with the disease much more commonly than do adult animals. The parasites may become encysted in the lung tissue: in such a case they do not appear to be productive of much harm; on the other hand, when free, they may do very great harm. The ova, occurring in the food or water, gain access to the stomach during the process of eating or drinking. After reaching the stomach, the embryo is set free, enters the circulation, is carried to a particular part, and there remains; no part of the animal's body is secure from parasitic invasion. The above-mentioned parasites are developed to a considerable extent in the lungs. This disease prevails on both sides of Lake Erie, and to a considerable extent in the State of Ohio, and the dominion of Canada. It is most common in low-lying districts and in wet weather, every now and then, during wet seasons, well-marked outbreaks of the disease occurring.

Symptoms.—Frequently the first symptom noticed is the peculiar cough, which becomes increased in frequency and severity by excitement or exertion on the part of the patient. The circulation is not affected much. The appetite is impaired, and there is a discharge from the nostrils. On post-mortem examination the parasites may generally be detected with the naked eye, and by the use of the microscope all doubts can at once be set aside as to their presence or otherwise.

Treatment.—Change the animals to higher and dryer locality, and use remedies to destroy the parasites, as turpentine and linseed oil. The inhalation of chlorine gas will also kill the parasites. Place three or four of the affected animals in a loose-box; the chlorine gas may be generated by pouring sulphuric acid over a mixture of sodium chloride and manganese black oxide. When the animals begin to cough, liberate them. Sulphurous and formalin fumes (par-aldehyde) are also very effectual. An inter-tracheal injection of oil of turpentine (ʒi. to ʒii.), carbolic acid, glycerine and chloroform (ʒss. of each) was first used by Mr. Hutton of Kelso, and is very effectual. Afterwards give a generous diet, pure water, tonics, etc.

INFLUENZA

Definition.—Influenza may be defined to be a disease of a specific character, causing well-marked catarrhal and febrile symptoms, and often accompanied by complications in various organs of the body. It is generally accompanied by great prostration. It is unquestionably due to the presence of a specific organism or group of organisms, although these have not been definitely demonstrated yet. The great nerve centres, the brain and spinal cord, the lungs, the liver, and the pericardial sac, are each frequently affected. The disease is most prevalent in spring and autumn, but in some years it appears in an epizöotic form. It prevailed to a great extent in Canada in the winters 1867-1868. Another great outbreak occurred in 1872, beginning in Toronto. Scarcely a young horse comes into the city without becoming affected by influenza—particularly was this the case during the winter of 1878. The name 'influenza' was applied on account of some influence the stars were supposed to exert over the disease. All animals are liable to its attacks.

Causes.—Influenza is in all probability primarily and most frequently aided by some atmospheric influence, but its cause is unquestionably of a bacterial nature. Animals receiving an insufficient supply of food, and those in badly ventilated stables, are more predisposed to the disease. Experience tells us that if an animal is forced to breathe bad air during the greater part of the night and day, he is more susceptible to disease, no matter how well fed he may be, than an animal breathing pure air.

Contagion.—Nobody will deny that influenza is a very troublesome and contagious disease under certain circumstances, as, for instance, where large numbers of horses are kept crowded together in large stables—some stables being perfect hot-beds of influenza. A very healthy animal may resist the influence entirely, or, at all events, for a long period. The disease, so far as I know, has never been produced by inoculation; it occurs in the most severe form in large cities, and especially in underground stables, where, as a matter of course, the ventilation must be imperfect. The coarse breeds of horses appear to suffer more when attacked than the light breeds.

Symptoms.—The symptoms of influenza vary considerably in intensity and form. This is on account of the disease attacking different parts at different times. Any organ or organs may be attacked, and as a matter of course, the leading symptoms depend upon and are governed by the organ, or set of organs, most severely affected. Dulness is the first symptom observed, the animal appearing languid, and in many cases the slightest exertion will cause him to sweat freely. The coat is staring, and the animal has an unthrifty appearance generally. A slight cough is heard now and then. The circulation is not affected, neither is the temperature increased at this time; but of course both temperature and circulation become affected as the disease progresses. The appetite is gone or impaired. The mouth is hot and dry. A rise of temperature takes place. The cough increases in frequency and is easily excited by pressure over the region of the larynx, as in a large majority of cases the respiratory organs are affected. The urine is scanty, and the bowels are costive, the fæces being hard and slimy, and some of the constituents of the urine are increased in quantity. The pulse runs up, except when the nerve centres are affected. More decisive symptoms now appear. When made to walk out, the patient reels and staggers, and appears to be very weak; the staggering gait occurs in consequence of the poison in the system prostrating the nervous system. The patient also acts as though suffering from headache, and there is good reason to suppose that such is the case. In many cases the breathing becomes affected; this is best noticed by watching the nostrils, as the abdominal breathing one might naturally expect to see is not present. If the lungs or bronchial tubes become affected, all the ordinary symptoms, as râles, crepitation, etc., are manifested. At this stage there are certain external appearances or symptoms made manifest, as, for instance, the legs may be cold, and in an hour afterwards hot, or there may be one hot and the others cold; this is symptomatic of fever. Great debility is a prominent symptom.

In other cases we notice the mucous membranes affected, first being injected, reddened, and dry. This is followed by a discharge from the nostrils, which is a favourable sign if of a yellowish colour, and now the patient usually does well; if the nasal discharge is of an iron rust appearance, it should be viewed with great suspicion, as it is evident that the bronchial tubes are affected to a great extent, and death may take place. In conjunction with the nasal discharge there is usually a flow of tears from the eyes. In some cases the difficulty in breathing becomes increased, cold sweats break out, the animal wanders round the box in almost an unconscious condition; a brownish discharge flows from the nostrils, and the pulse becomes fluttering and irregular, or intermittent. Where such symptoms are presented the case may be regarded as an almost inevitably hopeless one. Sometimes the liver is affected. When it is, there is a yellowish tinge of the mucous membranes, abdominal pain may be experienced by the animal, and is manifested by the usual symptoms. In case enteritis sets in, of course a fatal termination is very likely to occur. The administration of aloes in this disease is contra-indicated as being liable to produce undue catharsis. Abdominal complications occurring in this disease are often very slow in becoming cured. In some cases œdematous swellings of the legs occur, and of the sheath, if the patient be a male. If these symptoms are found in the latter stages of the disease, accompanied by a quick intermittent pulse, it is a bad sign; on the contrary, if we notice œdematous swellings on the second or third day, early in the disease, with an unchanged pulse, the lungs, not affected, etc., the chances of recovery may be regarded as good, the œdematous swellings being evidently Nature's method of affording relief, tending to relieve the fever to a great extent in connection with some other part. Many cases of influenza terminate in pneumonia, pleurisy, effusion, etc. When the lungs become affected the animal persistently stands, the breathing becomes difficult, the pulse quick and weak, and in a short while a nasal discharge occurs. The appetite is completely lost in most cases, yet a cure may be effected by proper and energetic treatment. A subacute inflammation of the lungs is likelier than any other form to follow influenza, for the reason that the nerve centres, being depressed, allow effusion to take place very easily from the weakened vessels, and in such a case the animal may lie down when greatly weakened. On lying down, the respirations increase in number and difficulty. However, the patient should be allowed to remain down so long as the breathing is not too difficult; he should be carefully watched, to see that he does not get under the manger, or otherwise become entangled and hurt himself.

Complications and Sequelæ.—The complications most commonly met with in influenza are pneumonia, pleurisy, purpura hæmorrhagica, and rheumatism. When the liver has been badly affected, jaundice is a troublesome sequel. If the disease takes on the rheumatic form the symptoms are as follows: The animal, perhaps, has had influenza for eight or ten days, and seems to be doing well, when it is discovered that he has suddenly and unaccountably become lame, in perhaps one or more fetlocks. In a day or two it becomes clear that the trouble is rheumatoid, the articulations being involved, and the fetlock oftener than any other joint. Rheumatism often occurs as a sequel to a comparatively mild attack of influenza, and may be due to the surroundings of the patient, or from the poison being retained in the blood. Sometimes it affects the hock-joint; at other times the sheath of the flexor tendons is more particularly affected, or the pericardial sac may become affected, and death result. It is a very insidious disease, as the animal does not appear to be much affected until beyond reach of all human aid.

Treatment.—The treatment of influenza is generally very satisfactory if taken in time. It is a well-marked fever, and fevers always run a certain course; hence we must direct our efforts to enable, or help nature to throw off the disease, and support the animal while the disease is running its course. The importance of placing the patient in a well-ventilated loose box cannot be over-estimated. Clothe the body according to the season. Hand-rub and bandage the legs. It should be borne in mind that the patient is not to be kept warm by closing up the doors and windows of his box; on the contrary, while draughts should be avoided, the doors and windows are to be thrown open to allow an abundance of fresh air to enter, and keep the animal warm by clothing properly.

Medicinal remedies, as a rule, are those that tend to support the system and assist nature to throw off the disease. The preparations of sodium and potassium are indicated, particularly potassium chlorate, which is probably the most important of all medicinal agents used in the treatment of influenza; ʒii.–ʒiii. doses may be given in the drinking water, or in a draught. If the throat is involved, great care must be observed in administering draughts. Give plenty of cold water, and encourage the animal to drink it. If I were compelled to make a choice of one agent, to the exclusion of all others, with which to treat influenza, I would choose Potassæ Chlorat.; the administration of which should be continued for five or six days, until by increased appetite, improved pulse, the animal becoming brighter, etc., it becomes evident that nature is getting the better of the disease. In acidity of the stomach, Sodæ Carb. is to be given; and as stimulants

Liq. Acet. Ammon. ℥ii.–℥iii. in water, or alcohol, beer, whisky, wine, etc., in the usual quantities may be given. Some veterinarians recommend the use of milk to sustain the animal, and if he has any appetite at all he should be given milk or eggs—the food should be of a nutritive and laxative character; however, if the appetite is very poor, anything he will take may be given, as a nice bit of hay, a carrot, or an apple. The judicious use of stimulants is to be persevered in; and, in this case, I think a good alcoholic stimulant, as good old whisky, is the best of all stimulants. Beef-tea is also recommended. In the convalescent stages use tonics, as iron, gentian, etc., but do not overdo stimulation, or the administration of beef-tea, milk, eggs, etc. Occasionally a case is met with where a sedative may be of use; but this is the exception. Belladonna, Hydrarg. Subchlor., Opium, and Digitalis, etc., have all been recommended, but close observation of the results obtained tends to prove that they are not of much benefit except in special instances. If the throat is sore, fomentations or applications of the ammoniacal liniment should be tried, or Cantharides Tr., mustard, etc.; and in an exceptional case it may be necessary to use Hydrarg. Iodidum Rubrum, especially when strangles and influenza co-exist, and an abscess is forming. If the lungs are affected, blankets wrung out of hot water, mustard, etc., may be applied to the sides of the thorax; but severe counter-irritation is not to be recommended. If costiveness is present, use injections, and Ol. Lini. ℥vi.–℥viii., or Mag. Sulph., may be given. In abdominal complications, when colicky pains are present, these must, of course, be treated, but as a rule strong sedatives are objectionable, as they cause too great depression. Great benefit always accrues from steaming the throat; when the patient is becoming convalescent, preparations of quinine and iron, with other vegetable and mineral tonics, are very useful, and good grooming is an excellent aid to recovery. Potassium iodide is useful in the hepatic complication. Formerly, when bleeding was so much practised, influenza was attended with very great fatality.

CHAPTER III

STRANGLES

Definition.—An acute contagious febrile disease peculiar to the horse, characterized usually by the formation of an abscess in the submaxillary space. It is most common in young animals, generally attacking animals from two to six years of age; yet it may occur in a sucking colt, or in a horse twenty years old. After occurring once in a well marked form, it very rarely attacks the same animal. The disease was first called strangles by Gervase Markham, a couple of hundred years ago, and received the name on account of the urgent symptoms of strangulation manifested. Strangles, so far as I know, is peculiar to the equine race, and does not attack any other species of animals. The areolar tissue is the first to become affected. The tumour forms sometimes in the groin, behind the shoulder, and not unfrequently in the intestines, or mesentery, usually close to a ganglion of lymphatic vessels; this is known as the irregular or malignant form of strangles (bastard strangles), and is often very troublesome and dangerous—as in cases where the abscess forms in the mesentery or other situation, where it is extremely difficult, or even impossible, to get at it. Sometimes an animal, while appearing to be in a perfectly normal condition otherwise, will be noticed to move stiffly, and on examination an abscess will be found on the inside of the thigh. Some horses escape it altogether; but such cases are few and far between.

Causes.—The cause has now been clearly demonstrated to be due to an organism, a streptococcus, and it is mainly to the researches of Schütz that this has been proved.

Exposure to contagion is a common cause of its spread, and I am of the opinion that it is contagious under certain circumstances, but I do not consider it as a very highly contagious disease. It often runs through a stable, affecting every animal in it; and other instances are frequently met with in which only one or two may be affected and the rest escape. It is claimed that strangles has been produced by inoculation. Atmospheric conditions may possibly have something to do with its spread. Certain influences, as impure air, poor keep, or anything that tends to debilitate, certainly have a tendency to aggravate, if not actually produce, an attack of strangles. It may occur at any season of the year, and will often occur on bringing a horse into the stable in the spring, after allowing him to run out in the barn-yard or straw-yard during the winter—occurring in such a case as the sequel to change of temperature, a change from a cold place to a warm place producing the disease more readily than the opposite change. Some writers have likened it to scrofula, but I have no faith in any such theory.

Symptoms.—The symptoms of strangles, in an early stage of the disease, are frequently somewhat similar to those of catarrh. Sometimes for days or weeks before the acute symptoms of the disease are manifested, the animal appears dull, languid, and weak, perspires on very slight exertion, is easily fatigued, and the appetite is impaired. If an animal three or four years old presents the above symptoms, it is frequently said that he is 'breeding strangles,' and no doubt he is. The first decided symptom is that of difficult deglutition, and an elevation of temperature takes place. The head is kept in a stiff position, and on attempting to turn him, it is seen that he moves around with difficulty. The pulse is usually weak, coat staring, bowels constipated, and the fæces covered with mucus. Salivary secretion is largely increased. A careful examination should be made, as an increased flow of saliva may be induced by the presence of a foreign body in the mouth, carious teeth, etc. Similar symptoms are observed in laryngitis, but soon in strangles there is observed the formation of a tumour in the submaxillary space. The tumour is at first hard, but enlarges, becomes soft, and finally bursts, or has to be opened to prevent its bursting on the inside. The febrile symptoms are so mild in some cases as to escape observation, and in such cases the formation of the tumour is the first symptom noticed; in other cases the abscess or tumour may possibly attain the size of the closed hand, and at the same time not affect the horse at all, so far as deglutition is concerned. Another symptom sometimes occurring is a discharge from the nostrils. Strangles, like all fevers, runs a certain course, its duration being from eight to ten days, and in twenty days the animal is usually fit to be put to work. In a horse that has been, or is, a roarer, the symptoms are frequently of a very alarming character. If the formation of the tumour be not closely watched, and its contents evacuated at the proper time, it may burst internally, flow into the trachea, and cause death by suffocation. In some cases the animal becomes emaciated, the pulse weak, signs of abdominal pain are shown, and absence of the usual submaxillary abscess, etc., is observed. These symptoms are indicative of the irregular or malignant form of strangles, and the formation of an abscess in some of the viscera. In other cases there are symptoms presented which show that the brain and spinal cord, or nerve centres, are affected. The breathing becomes affected, the appetite becomes impaired, pulse weak, etc., showing the presence of a case of malignant or irregular strangles, in which form I think the abscess will oftenest be found in connection with the lungs, abdominal viscera, and sometimes in the heart. An abscess may form in any part of the body, no organ, or set of organs, being secure from an invasion. The abscess, or tumour, as it ordinarily occurs in the submaxillary space, varies considerably in size, in some cases being no larger than the end of a man's little finger. On the other hand, it may extend forward even to the lips, or right up to and affecting the parotid glands. The whole jaw, or even the whole of the head, may occasionally become one mass of corruption.

Treatment.—The treatment of strangles, as it ordinarily occurs, is by no means a difficult matter. The patient should be placed in a comfortable, dry, and well-ventilated loose-box. Pure air in unlimited quantities constituting an important part of the treatment of this malady, nature must in every possible way be assisted in throwing off the disease. The animal should be clothed in a judicious manner, and the diet should consist of nutritive and easily digestible food. Febrifuges are indicated, but I do not advise their employment to the same extent as in influenza. A few doses of potassium nitrate may be administered. In a few days benefit accrues from the use of tonics, more especially if anorexia, complete or partial, is present as a symptom; but during the early or acute stages of fevers the use of tonics is a practice to be condemned. The patient may be given gentle walking exercise in the sun, and if the abscess is tardy in development, agents to encourage or assist the process must be employed. Hence stimulate with heat and moisture, as the ammoniacal, or camphorated liniments, and a poultice afterwards. The latter should not be allowed to become cold. Unless it be kept *constantly warm*, it will not only do no good, but will do injury. It is not by any means an easy application to make, and to do it properly requires the employment of a many-tailed bandage, or a hood. In some cases the Ungt. Hydrarg. Biniodi. may be applied in the usual manner, as a vesicant. Whenever fluctuation of the abscess becomes perceptible, it should at once be evacuated, the best instrument for the purpose being Symes' abscess lancet. Care should be exercised not to wound a bloodvessel. In other cases where the development of the abscess is delayed, or its contents fail to effect an outlet on account of thickness of the walls, it is to be opened, using a knife and probe, or director, for the purpose. The pus, in some cases, may be situated five or six inches beneath the surface. A probe-pointed seton needle is a good instrument to use, if the abscess be situated in the brachial region. When symptoms of suffocation are urgent, perform the operation of tracheotomy; and it is in this disease that we have the best results from tracheotomy. In the convalescent stages sodium hyposulphite is useful as an antiseptic, when pyæmia is feared. Constipation may be relieved by enemas, and oleaginous draughts. Any attempt to cut the disease short by the administration of purgatives, etc., is fraught with danger. An animal may in some cases be worked lightly, but it is in all cases a dangerous experiment to put the patient to work until he is fully recovered.

EPIZÖOTIC CELLULITIS (PINK EYE)

This disease expends itself principally upon the nervous system, causing very great prostration and swelling of the mucous and areolar tissues. I consider that it differs very materially from influenza, notwithstanding some of the most prominent English veterinarians regard it as a form of influenza.

Causes.—It is difficult to say what the cause is. However, it is probably due to the presence of germs, which have passed into the system from without. Recent researches appear to bear out this view, although the specific organism has not yet been definitely demonstrated. The disease originated in the East and gradually moved Westward.

Symptoms.—The first symptom that strikes the attention is a discharge from the eyes, and a reddened appearance of the conjunctiva is observable at the same time. The patient appears dull; the appetite is more or less affected; there is a weak pulse, mouth hot, temperature increased to 103° to 105° Fahr. The eyelids are slightly swollen. The discharge from the eyes assumes a muco-purulent character. More or less œdema is usually observed in connection with the limbs. The swelling may extend along the belly. Constipation is usually present, and the fæces are coated with mucus. There may be a cough. The patient becomes very weak, and if put to work, complications may arise and cause death. The disease often shows itself in connection with the ligaments and articulations. The above symptoms persist for three or four days and then subside. The temperature decreases, pulse becomes normal, the appetite returns, and other signs are observed indicating that recovery is taking place. Some horses succumb sooner than others, and stallions especially succumb quicker than mares or geldings, one reason for which perhaps is that stallions, usually being of considerable value, are doctored and physicked to death, and worried by too much attention. Frequently pregnant mares, on becoming attacked, abort. There may be more or less abdominal pain manifested, according as the areolar tissue in the neighbourhood of the intestinal track is more or less affected. Diarrhœa usually occurs spontaneously, and it is to be regarded as a favourable sign. The febrile symptoms are well marked.

Treatment.—Epizöotic cellulitis is a fairly satisfactory disease to treat, and when proper and timely treatment is adopted, the rate of mortality is not high. The system must be kept up by nutrients, whilst stimulants and febrifuges are indicated as medicines. Potassium nitrate is useful in the drinking water, and quinine is an excellent drug because it possesses not only tonic and febrifuge, but also antiseptic properties. In the treatment of this disease, the animal should be given comfortable quarters, and should be judiciously clothed. Perfect quietude, if possible, should be observed. Cold water should be allowed in liberal quantities; food of a soft kind should be given. When stimulants are needed, ammonium carbonate may be given, once or twice daily, in conjunction with nitrous ether, brandy, or whisky, in cold gruel. Epsom salts may be given as a laxative. Some writers recommend linseed oil, but my experience is that magnesium sulphate is usually better. We find that the disease in many cases has a tendency to cause slight diarrhœa. The eyes and nostrils should be bathed with water, and a mild collyrium may be used for the eyes. Everything should be done to promote the general comfort and good hygienic surroundings of the patient.

Course, complications, etc.—In ordinary cases of epizöotic cellulitis the organs of respiration are not generally implicated, and in some cases not at all, and in this respect it differs from influenza. It is also more quickly developed and runs its course quicker than influenza, the duration of the disease usually being about nine or ten days, while influenza lasts from ten to thirty days, and is not nearly so amenable to treatment as the disease under consideration Complications may, of course, occur, and are to be dreaded. They must be treated as they arise.

PURPURA HÆMORRHAGICA

Purpura hæmorrhagica is a disease of a low febrile type, most generally occurring as a result of some previous disease of a debilitating nature, such as strangles or influenza. It is a disease of a septic character, and is usually noticed to occur in animals which have been kept, when ill, in badly-ventilated or ill-drained stables. It cannot be communicated by inoculation. A very great change takes place in the blood, which, losing its usual characteristics, becomes very fluid, and of a darker hue than that of a healthy animal; it is only feebly, if at all, coagulable; the capillary system of the mucous tract is considerably affected, allowing great extravasation of blood to take place. Probably a micro-organism is at the bottom of the mischief, gaining entrance and working its ravages when the system is in an enfeebled state.

Causes.—As before stated, purpura hæmorrhagica occurs as a sequel in most cases to some other disease, and more particularly follows diseases of a very debilitating character, as catarrh, strangles, influenza, etc.: probably following influenza more frequently than any of the other diseases named. Filthy and improperly ventilated stables, impure air, etc., highly predispose, and may prove the exciting causes of purpura; and sudden changes, as alternations of temperature while suffering from another disease, as influenza, etc., has a tendency to produce it, as has putting an animal to work too soon after previous disease, and while in a debilitated condition.

Symptoms.—Often the first symptom noticed is swelling of one or both hind-legs, usually occurring in the neighbourhood of the hock. On walking the animal out the swelling is observed to disappear; its disappearance, however, is only temporary, as in an hour or so it is again observed, but possibly in another limb. The swelling is very characteristic, appearing as though a cord was tied around the limb in such a manner as to interfere with the circulation. The swelling is due to the extravasation of blood and serum which has taken place. All the visible mucous membranes are covered with patches of ecchymosis, purple in colour, and of various sizes, in some cases not much larger than a pin-head, but growing larger, and often becoming confluent, and causing sloughing of the mucous membrane to such an extent that in some cases the disease might be mistaken for glanders. The pulse varies in character: in some cases being much quickened, while in other cases it is not very much increased in frequency. The slightest change in the weather will produce rigors. The temperature suddenly becomes elevated to about 104°—106° Fahr., and in some cases even exceeds the highest point mentioned. There may be observed swelling of the eyelids, and of the lower lip, which latter is tense and stiff, and has a glistening appearance; the eyelids may in some cases be everted. The swelling may occur in the fore-legs, but is more commonly found occurring in the hind-legs. When the nostrils become swollen, there is considerable danger of death from suffocation. Another characteristic feature of the disease is that the swelling will disappear from one place and reappear in another. The udder, sheath, or any part of the body may slough. When the breathing is interfered with, there is a snuffling sound to be heard, a slight discharge of matter and blood may come from the nose, and, in conjunction with sloughing of the soft tissues, renders the animal a pitiable and loathsome object. There is a loss of appetite, or perhaps inability to take food; the bowels may be constipated, and the urine is of a higher colour than usual, but scanty. Sometimes the external manifestations of purpura hæmorrhagica are entirely absent—such a case, though, is rare. In a horse with a white heel, or leg, the purple spots in the skin are plainly visible; flies will soon attack and fly-blow the sloughs if not closely attended to.

Prognosis.—This should be somewhat guarded, as frequently the animal, after getting along satisfactorily for several days, suddenly becomes worse, and dies. The signs of amendment are gradual improvement of the appetite, the circulation becomes regular and increases in volume, the swelling of the extremities gradually subsides, the patient recovering in from ten days to six weeks; the last-mentioned time being generally occupied.

Treatment.—Remove the patient from all obnoxious surroundings. He should be placed in a scrupulously clean and dry loose-box, to which fresh air and sunlight have free access. In purpura the products going to form albumen and fibrin are deficient in quantity, hence Potass. Chlor. is indicated on account of its peculiar action on the blood, the dose being ℥i.—℥i. ss. daily for the first day or two, then ʒii.—ʒiii. daily. Ol. Terebinth. as a styptic, in doses of ℥ii. every alternate day or so, is very beneficial; it also tends to regulate the bowels. Enemas are beneficial, and I believe that occasionally a purgative acting nicely on the bowels is of great service; but I do not recommend purgatives in other than exceptional cases, and it should in all cases be an oleaginous one. Tr. Ferri. Perchlor. may be given in full doses. If the patient be weak, alcoholic stimulants may be administered; but ammonia should never be given under any circumstances. As local applications, vinegar, lead acetate, etc., may be used; and hot or cold water to sponge the nostrils with. Local applications at best are of doubtful efficacy, but must be made for obvious reasons. Gentle hand-rubbing is beneficial; the swellings should not be lanced unless moist.* Fomentations are of no value except to allay pain just for the time being. In some cases it may be necessary to perform tracheotomy; but the system is so vitiated in the majority of cases of purpura, that as a rule the operation yields temporary relief only, the animal succumbing in the end.

During the past few years, observations by Prof. Dieckerhoff have shown that iodine is almost a specific for purpura. It may be given as Liq. Iodi in full doses, or, better still, intertracheally. Dieckerhoff's solution consists of Iodi Resub. 1 part, Potass. Iodi 5 parts, Aq. 100 parts.† Of this from ʒii. to ʒi. is injected into the trachea very slowly once, twice, or even three times a day. The results are excellent, and no further treatment is as a rule required.

Purpura Simplex is the term applied to a mild form of purpura. The visible mucous membranes are reddened instead of spotted, the throat is sore, etc. The treatment is the same as above, although it need not be so energetic, and the symptoms usually disappear without much trouble.

CHAPTER IV

LYMPHANGITIS

Definition.—An inflammation of the lymphatic glands and vessels. The disease is known by a great variety of names, as 'water farcy,' 'weed,' 'Monday morning disease,' 'shot of grease,' 'big leg,' 'inflammatory œdema,' etc.; the last-mentioned not being by any means a bad name. Lymphangitis in the horse is usually confined to the extremities, and more frequently affects the hind-legs than the fore-legs. The disease is seldom seen affecting more than one limb at a time. The heaviest breeds of horses are predisposed to lymphangitis, as in such horses the absorbent system is far more sluggish than it is in the lighter breeds; and more particularly are predisposed good feeders, with coarse, round limbs. The disease is very common in England and Scotland, and also in every city practice.

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* If lanced or bursted the wound takes a long time to heal, and as a rule the swelling will disappear or change its situation in a few days, or even hours.

† For the translation of the report of this excellent method of treatment into English, the profession is indebted to Mr. John A. W. Dollar, M.R.C.V.S.

Causes.—As previously stated, some animals are undoubtedly predisposed to this disease, as heavy, phlegmatic horses, etc.; but the disease may occur in the very best bred horses. A common cause is, after an animal has been used to hard work, allowing him to stand in the stable idle for a few days, and giving at the same time as much food as he had when working; consequently more chyle is formed than can be used, the lymphatic glands and vessels become overloaded and irritated, inflammation follows, and lymphangitis becomes established. When a horse rests, the quantity of food should be decreased; and in some cases a diuretic should be administered. Another cause of lymphangitis is direct injury, as punctured wounds and kicks; and it is sometimes caused by brushing, cold getting into the wound, or the application of some irritant dressing. An exceptional cause is cracked heels. It also sometimes occurs after the animal has suffered with a debilitating disease. In such a case it is due to the breaking up of tissue; and as a rule in such cases both hind-legs are simultaneously affected. However, we may very properly consider the disease to be a dietetic affection, as it is generally caused by a too stimulating diet, and in this form also occurs in its greatest severity.

Symptoms.—The disease begins with rigors, which are sometimes very severe; the animal trembles violently; the mouth is hot; respirations are increased in number; violent febrile symptoms are manifested, the pulse being full and bounding, varying from fifty-five to eighty beats per minute. The lameness and swelling vary, but are usually very excessive, often causing the patient to hold the affected limb up from the ground. The swelling usually appears on the inside of the thigh, involving a lymphatic gland, then a vessel, gradually extending downwards. The swelling, as well as extending in area, becomes increased in size, causing, in addition to excessive pain, great difficulty in moving the limb. On palpation the corded condition of the lymphatic vessel is discovered. The limb is also found to be hot; and, on pressure, pain is manifested. The inflammation is of the sthenic type; the swelling usually extends to, and involves, the inguinal glands. There may be perspiration about the shoulders or flanks, as a result of the severe pain; the countenance bears a very anxious expression; the patient generally stands, but if the pain is excessive he will sometimes lie down, and cannot or will not rise unless assisted. Constipation is usually present; urine decreased in quantity and heightened in colour, and contains more urea than in health. A well-marked symptom is partial, or complete, anorexia, generally the latter, and a strong desire for water. If the case is not attended to at once, more or less change takes place; a slight exudate is thrown out, which becomes organized, and on repeated attacks further exudation takes place, becomes organized, and causes further enlargement, finally resulting in a condition known as elephantiasis. A very rare termination of lymphangitis is suppuration. When the disease occurs in the anterior extremities, I do not think it is quite so severe as when occurring in the posterior extremities, although the constitutional symptoms are about the same. When the disease is caused by a puncture of the coronet, the swelling may begin below and extend upwards; but otherwise it always begins above and extends downwards. The symptoms of lymphangitis are all very plain, well marked, and characteristic of the disease, and should be easily recognised by anyone who understands the condition, or has ever seen a case previously.

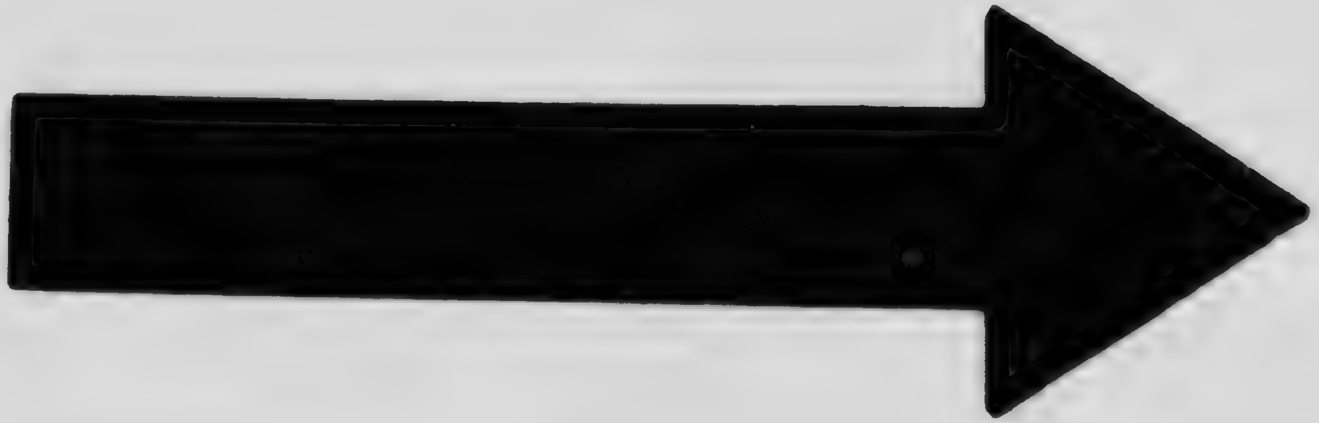
Treatment.—The treatment of lymphangitis must be energetic and careful. Venesection was much practised at one time, and although condemned by some, and the disease being curable without it, I must say that I think very highly of a moderate depletion, or in some cases (especially if very plethoric) a pretty good abstraction of blood; or a good strong cathartic may be given, as Aloes Barb. ℥v.—℥viii. Diuretics may also be freely given. Aconite Tr. ♏ x.—♏ xii. every four hours should be given to combat pyrexia. Enemas should be frequently and freely employed as a stimulant of peristalsis. Vesicants locally are contra-indicated. The limbs should be judiciously fomented with moderately warm water. This is useful to allay pain by relaxing the tissues, allowing further swelling to take place. The limb should be thoroughly dried after fomenting, and then bandaged, or something applied to retain heat in the part, as a hay-rope, etc. Subcutaneous injections of morphia, or the application of belladonna plasters, may be employed to allay pain. In a few days the swelling will subside, and diuretics may be given to cause absorption of the exudate.

Elephantiasis.—As a result of the inflammation occurring in lymphangitis, an exudate is thrown out which becomes solidified. Simultaneously the areolar tissue becomes thickened, and altered conditions take place throughout the new structure, constituting a thickening known as 'elephantiasis.' This condition may occur as the result of one attack only of lymphangitis, but more frequently as the result of repeated attacks of lymphangitis. When the thickening is but slight, it interferes but little with the usefulness of the animal. He is, however, more apt to suffer from an attack of lymphangitis after a previous attack than if he had never before suffered. Elephantiasis may also occur as a sequel to a case of grease—more particularly where such has been improperly treated. There may be a varicose or dilated condition of the veins in elephantiasis.

Treatment.—A clear case of elephantiasis is incurable. However, the administration of a laxative bolus, followed by diuretics, careful dieting, with good care generally, and the application of cold water and astringents, which tend to strengthen and increase the action of the absorbents, will help the worst cases.

Œdema.—We are often called upon to prescribe for swellings and enlargements of the legs and body, more frequently the former: say the limbs of a pretty good horse have suddenly become swollen to a slight extent, the interstices of the connective tissue become filled with a serous fluid, derived from the percolation of the watery parts of the blood through the bloodvessels, owing to a weakened condition of the latter. There may or may not be albumen exuded with the fluid. The worst and most obstinate form is that in which albumen occurs in the exudate.

Causes.—The most frequent cause of this condition is debility. Compression also is a cause, as, for instance, a tight bandage, causing venous obstruction, and a consequent enlargement of the part. The enlargement oftenest occurs in one or both hind limbs, and is usually referred to as stocking. Working a horse, and at the same time cutting down the food either in quality or quantity, may also be mentioned as another cause. In other cases it may be due to a debilitated, or poorly fed animal, receiving food of a



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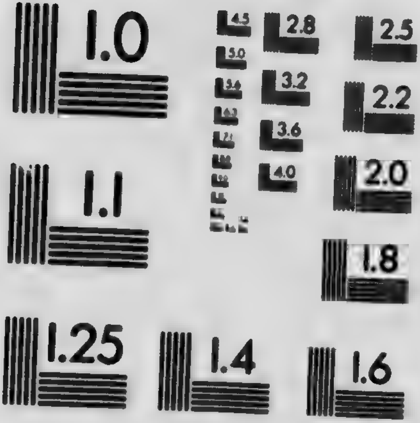

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better quality, and in greater quantities than he has previously been used to. Hence, it will be seen that the trouble may result from two very opposite conditions of the blood—being too rich, or being too watery. Exposure will also cause it. The swelling may be noticed between the fore limbs, on the chest, extending along the belly, etc.; in fact, no part of the body being exempt. Inflammatory action will also produce it.

Symptoms.—When due to debility, or venous congestion, the swelling pits readily upon pressure, and there is no heat or pain in the part. When it occurs as a result of inflammatory action, the part is hard to the touch, will not pit upon pressure, and the presence of both heat and pain is clearly manifest.

Treatment.—The treatment of a condition arising from so many different causes must necessarily vary somewhat. If it is the result of debility, the administration of a gentle laxative is indicated, which exerts a beneficial effect by gently acting upon the bowels and stimulating the absorbents. Diuretics and tonics are also of considerable service, such drugs as Potassium Iodide ʒi.—ʒii., Tr. Gentianæ ʒii., Potassium Nitrate with Resin may be given. Nitrous ether, in the usual dose, is often beneficial also. Proper feeding, both as regards quantity and quality, should not be neglected. The local treatment consists of fomentations, removal of the bandages in cases where it is due to tight bandaging, and a judicious use of hot or cold applications according to the season. As a rule, cold applications are the best. Hard-rub and dry the part well, and give gentle exercise, after which a bandage applied so as to maintain a gentle and equable pressure will be found of great benefit. If a bandage be applied improperly, or is neglected, the limb may swell, and, as the bandage will not give way, venous obstruction will be the result, and the condition become aggravated instead of relieved. Astringent lotions are useful, as lead acetate ʒss., water O.i.—O.ii., or tincture of arnica may be used. The animal should be kept from work. Counter-irritants should never be used. Veratrum gr. xx., once or twice daily, is recommended as an absorbent, followed by a course of mineral or vegetable tonics, such as iron and quinine. If the heart is weak, digitalis is useful. A run at pasture for a week or two will afford material assistance to medical agents. Judicious exercise is highly beneficial.

CHAPTER V

Affections of the Skin

THE skin, or tegumentary system, envelops the body, and it differs in thickness in different parts of the same body, as well as in different animals. It is very porous and exceedingly elastic. In some parts of the body it is loosely attached, while in some other parts it is tightly attached. It is made up of the cutis, or true skin, and the epidermis, or scarf, skin. The corium, or under, and the papillary, or upper layer, form the true skin. The skin serves for purposes of protection, and becomes continuous with the mucous membrane at the lips, anus, etc. The appendages of the skin are hair, sebaceous and sudoriferous, or sweat glands, follicles, etc. The soft, smooth hair covering the body of the horse is known as the coat, while the coarse hair of the mane and tail is referred to as horsehair. Whenever a hair-bulb is completely destroyed, the hair is never reproduced. In fever the hair becomes harsh and dry, due, no doubt, to the fever affecting the hair follicle. The sudoriferous glands are very abundant and highly developed in the horse; for this reason the horse perspires more freely than any other animal. Perspiration prevents too great a rise of temperature, and relieves the system to a great extent, and more particularly during severe exertion. It is computed that there are about two thousand of those glands to the square inch of the body surface. The sudoriferous, as well as the sebaceous, glands are more numerous in the flexures of the heels, hocks, knees, etc., and those parts are subject to many diseases. The sebaceous glands secrete and throw out a fluid which lubricates and serves to keep the skin in a soft and supple condition. The skin is subject to inflammations of various kinds. We may have erythematous inflammation of the skin, presenting at first well-marked congestion, followed by inflammation, and which, if allowed to go on, may result in an eczematous condition, as in greasy heel, etc., or ulcers, which may be constitutional or sympathetic, depending upon some functional nervous derangement. This eczematous condition is very troublesome to treat if neglected and allowed to become chronic.

We have pimples, scales, rashes, tubercles, pustules, vesicles, spots, etc., in connection with the skin, all of which will receive due consideration.

CRACKED HEELS

This condition is very commonly known by the name of 'scratches,' and is a well-marked erythematous condition during the first stages, but if the irritation is kept up, it soon becomes eczematous. This trouble is a very common one amongst racehorses, affecting both runners and trotters. Irritation is set up. There is at first merely congestion in the superficial layer of the skin. The irritation is kept up until an eczematous condition ensues, and desquamation of the cuticle takes place. The heavy breeds of horses are most liable to this trouble. The disease is of much greater frequency in the hind-legs than in the fore-legs.

Causes.—Cracked heels are produced in a variety of ways, as washing the heels and not drying them properly, irregular exercise, standing in filthy, wet stables, etc. A common cause of the disease in racehorses and horses of fast work is, that on sweating freely the perspiration runs down upon the heels, and, collecting there, irritates and causes them to crack; or injudicious treatment, as applying a bandage to the heels and up the legs after perspiration has poured down and become accumulated in the flexures of the heels. Heat and cold, acting alternately, will produce cracked heels, as, for instance, washing the heels with warm water after travelling the animal through cold slush or mud. Sometimes the animal gets his foot over the halter and rubs it, setting up an irritation which by injudicious treatment terminates in cracked heels. A bad practice, and a very common cause of cracked heels, is washing the animal's legs every time he comes in, and neglecting to dry them, as a result of which inflammation, after congestion, is quickly produced, and an erythematous condition of the limb is set up. The condition may also be brought about by the injudicious use of vesicants, or, in fact, may be produced by any irritant substance whatever. Cracked heels is a condition rarely seen among cavalry or artillery horses, as they are properly cared for.

Symptoms.—Usually the first symptom noticed is a slightly reddened appearance of the heel; this is soon followed by the appearance of cracks or fissures, which usually extend transversely. If in the fore limbs, there will be stiff action at first, the blood may even ooze out, but when warmed up the stiffness will disappear. Stiffness in a less degree is observed when the hind limbs are affected. The affected limb sometimes presents a slightly œdematous condition, extending in some cases as high as the hock.

Treatment.—A thorough examination should be made in every instance, so as to ascertain as nearly as possible the exact condition of the parts; also endeavour to discover the exciting cause, and, having found it, its removal should be effected if possible. The animal is to be placed in a comfortable loose-box, and be allowed to rest while undergoing treatment. In many cases a brisk cathartic is of great service, more particularly if the patient is in a plethoric state. If the pain or irritation of the heels is very considerable, poultices of linseed-meal, boiled turnips, etc., will be found very useful, allaying irritation, soothing, and softening the part, and tending generally to bring about a healthy condition. The ordinary white lotion is also of great benefit, and may be applied of increased or reduced strength, according as judgment dictates. A solution of Acid. Carbol. in water (1—16 to 1—40), as the case demands, is very useful. Astringent lotions have a good effect, if not applied too long. Cupri Sulph. may be used in solution, as may Zinci Sulphas, Plumbi Acet., etc. The legs are to be bathed in tepid water, without the use of soap, after which they are to be thoroughly dried in a gentle manner, and glycerine applied to prevent hardening of the part. A case of cracked heels is, in fact, to be treated exactly as you would treat a chafe on your hand or finger; it is not necessary to wash the heels every day. Occasionally a case is met with where the disease has taken on an indolent character. In such a case it is necessary to stimulate the parts: use Acid. Carbol. (1—12 to 1—20), poultices, etc. A useful lotion is as follows: Acid. Carbol. ʒss., Spts. Vini Recti. ʒi., Aqua Destil. O.i. Potassæ Iodid. may be given. When the animal is going out apply glycerine; on his coming in apply a poultice. A useful emollient emulsion consists of Liq. Plumbi., Glycerini āā 1 part, Ol. Olivæ 2 parts. Lanolin, zinc, or boracic acid ointments are also excellent. When irritation ceases, exercise gently.

MUD FEVER

This condition consists of a superficial or erythematous inflammation of the skin, in the region of the hock behind, and the knees in front, and has received the name of mud fever because it occurs usually as a result of irritation caused by allowing mud and slush to accumulate on the legs.

Causes.—Mud fever may result from any of the causes which operate in the production of cracked heels, and which were mentioned when treating of that condition. Mud fever is most common during the spring and autumn, when cold water is used to wash the legs ; frequently done by turning on a jet of water from a hose—a thing that should never be done.

Symptoms.—On examination a superficial inflammation of the skin is discovered, in some cases extending up to the shoulders. The pain is frequently quite severe, the hair loses its connection to a certain extent, the irritation extends to the subcutaneous tissues, often giving rise to considerable swelling, and causing sloughing. In some cases where the exciting cause is kept up, the pulse becomes quickened, and a rise of temperature may often be noticed. The appetite is considerably impaired, and if the exciting cause be kept up, the general system becomes very much affected.

Treatment.—Remove the exciting cause, place the animal in a comfortable loose box, give a purgative and a febrifuge, massage the limbs, but do not bandage. Astringent lotions are very useful, particularly those containing lead, weak carbolic acid lotion, or any preparation recommended for cracked heels. If there is much irritation present, an anodyne, as Opii Tr., may be added to any of the lotions mentioned. In a very bad case an abscess may form, and if it does, is to be treated in the same manner as an abscess of any other part. The hair usually comes off, but nearly always reappears.

Prevention.—If a horse is out the greater part of the day in the mud and slush, the rough portion of the mud should be rubbed off when he comes in. After standing an hour or two, rub the remainder off. This is the best mode of prevention.

URTICARIA

This is an erythematous condition, characterized by the appearance of small elastic eminences, varying in size and shape, and which may be observed over the whole body surface, but more particularly in the region of the neck, shoulders, flanks, etc., a peculiarity being the very sudden appearance of the eminences, which frequently disappear as quickly as they have come. It is a common disorder in the summer months, or towards the autumn, when horses are changing their coats, and probably occurs with greater frequency among heavy than among light horses. The disease is also known by the names 'nettle-rash,' 'surfeit,' etc.

Causes.—Certain kinds of food produce it; and, I think, allowing an animal to drink when heated, allowing him to cool off suddenly when hot and sweating freely, eating tares or vetches, etc., are the most common causes of the trouble. There is great sympathy as well as similarity between the skin and mucous membranes, hence it may be readily understood how derangement of the digestive system may operate in producing urticaria. Take it all in all, digestive derangement is, I think, the most common cause.

Symptoms.—As before stated, the disorder is quickly produced. The eminences are elastic to the touch, and usually round or oval in shape. They may disappear in a few hours, or may persist for eight or ten days. In some cases as quickly as one set of elevations disappear, they are followed by a new lot. More or less of an itching sensation is usually experienced, as is evinced by the animal scratching himself and there may be a slight constitutional disturbance, pulse and appetite slightly affected, etc.

Treatment.—The food of the animal is to be changed, as well as reduced in quantity, the animal receiving very little food for the first twenty-four hours, as a bran-mash, for instance. A purgative may be given, the action of which will usually be followed by a remission of the symptoms. In other cases nothing more may be required than a simple alterative, such as sulphur, potassium nitrate, resin, etc., which may be given in the ordinary doses, and are preferable to cathartics in cases where the animal cannot be laid off work. Locally, a mild astringent lotion, such as that of ascetic acid or vinegar and water (1 to 20), or acetate of lead (1 to 20 or 30), may be applied with a sponge.

HERPES

Now and then cases are met with where a horse is suffering pretty severely from influenza; he arrives at the convalescent stage, when suddenly an eruption is observed to have taken place all over his body. This is a form of erythema, and is known as herpes. It is generally confined to the lips, but may involve the whole body, as neck, limbs, etc. The mucous membrane of the lips is involved. It is due to some changed condition of the blood.

Symptoms.—There is a reddened appearance of the skin; little pimples appear and become confluent. In some cases the hair falls off in patches, varying in size from that of one's thumb to three or four fingers; the animal perspires very easily. When the whole system is affected the pulsations increase in frequency, and the temperature becomes elevated, but such symptoms are absent in cases in which there is only a little local irritation of the lips.

Treatment.—As a rule this does not give much trouble, although the hair may be a long time in growing, or come through of a darker colour. Carbolic, iodine, sulphur, or weak biniodide of mercury ointments are useful, as are also astringents, such as lead, and alum or zinc sulphate lotions. Give alteratives and tonics internally.

SIMPLE ECZEMA

Eczema is a moist inflammation of the skin, and is particularly seen during hot weather. It may generally be considered as non-contagious, although this view is not tenable in every outbreak, especially since the recent discovery by Unna of a bacillus which is persistently present in some forms of human eczema.

Cause.—Simple eczema is supposed to be the result of a changed or perverted condition of the blood, produced, or at least aggravated, by a change from cold to hot weather, and by certain foods, barley particularly. It is sometimes seen in horses on pasture, and over-ripe grasses will produce it. After an animal has suffered from one attack, he is more susceptible to subsequent attacks than he would be if he had never suffered; more particularly is such the case when the animal is fed on a highly stimulating diet.

Symptoms.—There is usually first an 'erythema,' or dry inflammation of the skin, characterized by dryness of the hair and intense itchiness. In some cases it is very severe, causing the animal to rub his neck and head with very great violence on being brought in from work. On removal of the bridle he will rub the parts until extensive abrasions of the skin and destruction of the hair are produced. When running out he will often level the fence of his pasture in his frantic efforts to obtain relief. The head, neck, the region of the mane, root of the tail, etc., are the parts most affected; the vesicles contain an ichorous fluid. The disease frequently attacks a number of horses in the same establishment. In such a case it may be traced to bad management, which of course affects all the animals alike. As a distinguishing characteristic between eczema and mange one may remember that eczema usually comes on suddenly, while mange comes on gradually.

Treatment.—The treatment of simple eczema requires to be both local and constitutional. Endeavour to allay the irritation by having the parts thoroughly washed with tepid water, avoiding soft soap; after which dry thoroughly and bathe with an antiseptic or astringent lotion. Corrosive sublimate, spirit, and water, forms a useful lotion, as do also solutions of acetate of lead, alum, calamine and spirit, chinosol, creolin, or carbolic acid. Tr. of aconite, and hydrocyanic acid, well diluted, form still more powerful remedies. A compound solution of iodine is also highly useful in some cases. It is essential that a change of food is made, and that the animal be sheltered from the heat for a day or two. A cathartic may be administered, after which benefit will be derived by giving hyposulphite of soda or iodide of potash persistently. If a cure is not obtained by the above treatment, Fowler's solution may be tried, or arsenic itself given, either alone or mixed with sulphur, resin, and other alteratives. The treatment must be persevered in for some time even after an apparent cure has been made, or the result may only be temporary. Careful dieting, good grooming, and exercise are essential. The grooming tools should not be used for another horse.

MALLENDERS, SALLENDERS, PRURITIS

'Mallenders' is the name given to an eczematous condition occurring in the flexures of the knee-joints, causing alternately a persistent scurfiness of the parts. It is more common among heavy horses than among the lighter breeds, and stallions suffer more frequently than mares or geldings.

Causes.—It is caused by a sluggish circulation, improper dieting—as, for instance, feeding a horse on stimulating food in large quantities. Irregular exercise and dirt may also cause it, or it may be due to the action of a vesicant, especially if the vesicant contains some such ingredient as euphorbium.

Symptoms.—Irritation is set up in the part. Redness is observable in some cases, and a discharge of a serous character takes place. Cracks appear, and often extend quite through the skin, and in hot weather flies will attack the parts if not prevented. The more acute symptoms may after a while disappear, and the case take on a chronic form. Slight loss of condition may be also observed.

Treatment.—The employment of both local and constitutional remedies is called for in the treatment of this condition, and while it is not by any means a serious disease, it is, nevertheless, a matter of considerable difficulty to effect a cure. In some cases failure results. A laxative should be given, to be followed by pretty strong diuretics. In the meantime, the diet should be carefully attended to, and should consist of light and easily digestible food, given at regular intervals and in regular quantities. Cleanse the parts with hard soap and warm water, dry carefully, and apply some antiseptic or astringent ointment. Unguentum Iodi is very good, as also is Ung. Hydrarg. Fort. Corrosive sublimate lotion is in some cases useful; and the parts may be touched occasionally with a pencil of nitrate of silver, the healing process being accelerated thereby. Poultices are highly beneficial, but it is very difficult to apply and retain a poultice at this part. The treatment should be persevered in or a failure will result, and it may degenerate into a case of elephantiasis. Ol. Morrhuæ, applied daily with a feather, will prevent the attack of flies. Opium, or belladonna and glycerine makes a good mixture to allay irritation of the parts, as well as lubricating and keeping them soft. A horse in season should have a laxative, but if not in season, a brisk cathartic may be given.

Sallenders.—This condition occurs in the flexures of the hock, and with that exception it is exactly the same condition as mallenders. Its pathology, cause, sympton and treatment, are the same as mallenders. Of the two conditions, sallenders occurs probably with greater frequency than mallenders.

Prurigo, or Pruritis.—This is a disordered condition of the skin, caused by functional derangement of the nerve terminals. It occurs more particularly about the roots of the tail and mane. It is a very troublesome disease to treat because there is persistent itchiness of the skin, usually with nothing whatever to be seen to account for it.

Causes.—Too stimulating a diet, with irregular exercise, bad grooming, etc., are the causes of pruritis. It is oftenest seen during the hot months.

Symptoms.—The animal rubs the mane and tail, causing them to have a rough appearance. (Another cause of rubbing the tail is the presence of pin-worms in the rectum.)

Treatment.—Have the parts thoroughly cleansed with soap and warm water, and apply some antiseptic, astringent, or sedative lotion, such as creolin, alum, or lead and opium. Carbolic or sulphur ointments are also useful. In case of a valuable stallion kept in a loose-box, a bar of wood placed around the box in such a manner as to reach just above the hocks will render futile all endeavours to rub the tail. Change applications frequently, and do not wash the parts too often.

GREASE

A disease showing itself generally in connection with the heels of the horse. It is at first of an erythematous character, but subsequently becomes eczematous. It occurs as a result of irritation of the parts, and is known as 'grease,' on account of the peculiar oily or greasy character of the discharge which takes place from the affected part. There is first a superficial irritation, which finally extends to and involves the hair-follicles, sebaceous glands, etc. Heavy horses are far more subject to an attack than light horses. Climatic influences also play a prominent part in the production of the disease, 'grease' being far more common in Great Britain than on the American continent. The humid atmosphere of England sufficiently accounts for this fact. Some veterinarians have considered 'grease' to be contagious, and due to the presence of a parasite, but this has not yet been satisfactorily demonstrated.

Causes.—The causes of 'grease' are predisposing and exciting. Heavy breeds of horses may be said to be predisposed. The same may be said of horses possessing flat feet, and having large quantities of hair on their limbs. The hind limbs are affected oftener than the fore limbs, and such cases are perhaps more difficult to treat, on account of the remote situation of the parts from the circulatory centre. The exciting causes are—washing too frequently, or washing the parts and not drying thoroughly afterwards. The most common cause of 'grease,' however, is scratches, or, as it is better called, 'cracked heels' and the various causes which operate in producing 'cracked heels' also operate in producing 'grease.'

Symptoms.—There is more or less swelling of the parts. This is speedily followed by a slight discharge. A redness is also discernible. Soon the discharge becomes of a well-marked oily character; the hair comes out; the skin appears red and considerably inflamed. On first coming out of the stable, the animal walks very gingerly, but soon warms up and goes all right. After receiving exercise, and being allowed to stand until cool, the swelling is found to be greater than before, although exercise will cause the limb to decrease in size for the time being. In severe cases the papillæ become enlarged, having the appearance of grapes. Usually at this stage there is a very offensive odour to be detected. Sometimes there is a well-marked febrile disturbance, but not often. Grease, by neglect or improper treatment, may terminate in a case of elephantiasis.

Treatment.--The treatment of grease consists of an endeavour to arrest the discharge and bring about a healthy condition of the parts. It is a mistake to apply powerful astringents without first acting upon the system; so, after proper preparation, a good purgative is to be administered. The local treatment is also to be attended to. Clip the hair from the parts if it is long or if its removal be deemed necessary, after which long-continued fomentations and poultices will be of great benefit, soothing and softening the parts and allaying irritation. After this has disappeared, apply astringents, as zinc chloride, grs. xl. to a pint of water. Plumbi acetas may also be used. Carbolic acid lotion is also of service in many cases. When the inflammatory action is relieved to a certain extent, apply cotton-wool saturated with some astringent lotion. The wadding should be applied in such a manner as to exert a gentle pressure on the affected parts; and in cases where the discharge is very offensive in odour, deodorizing disinfectants should be used freely. Charcoal is a good deodorizer, as well as a desiccant, and may be applied in the form of powder. Another excellent application is broma-chloral. Exercise gently, and use glycerine to keep the parts soft, and prevent irritation while the animal is working or undergoing exercise. In the grape stage of the disease, the grapes are to be removed by excision, the use of caustics, or by the actual cautery, the latter method being the surest and most effectual. Two irons are required for the purpose—one cold, to protect the healthy structures, and the other hot, to remove the unhealthy structures. As a result of grease, we may have elephantiasis, etc. Another result of grease, although it sometimes occurs independently, is a foul-looking sore, or ulcer, on the heel. It should be treated by the application of poultices, caustics, and astringents or antiseptics, at discretion. After applying the caustic thoroughly the parts should be well poulticed, this being done continuously for two or three days, when generally a nice slough occurs. If, however, sufficient sloughing has not taken place, the caustic is to be applied again, and followed by a poultice, when it finally sloughs sufficiently. Astringent applications are to be used, the parts kept clean, etc. It must be borne in mind that all caustics are to be used carefully, or considerable damage may result. I might mention that yeast poultices are useful in grease; and while in some cases removal of the shoes is to be recommended, in other cases, where there are pretty large cracks, it is good practice to put on high-heeled shoes to remove the strain from the cracks. A run at pasture is also beneficial.

Malignant Boils. — This is a condition that resembles grease very much; but I consider that it differs materially from grease. I have never heard of a name for the condition, but I will call it malignant boils. It attacks the heels and fetlock, gradually extending to and involving the deeper structures of the foot, and even the laminæ; and soon the whole of the tissues in the vicinity take on a semi-gangrenous state, and people have suffered severely from blood-poisoning by coming into contact with an affected animal, or getting some of the purulent matter in a sore or other wound. The disease may be closely allied to what is known as 'furunculus,' due to exposure and frost-bite. In some cases I think the bone may be affected. The whole of the sensitive structures are affected and can easily be separated. Pyrexia and anorexia are well marked. Death may result quickly, or the animal may survive, in which case there is a thickened condition of the limb.

Treatment.—Give sodium hyposulphite and other antiseptics internally; use disinfectants, antiseptics, poultices, fomentations, astringents, etc., externally; give good food, tonics, etc. (Smith).

Ecthyma.—This condition is an eruptive pustular disease, and is sometimes called the American skin disease of horses. It has within the last few years made its appearance in England. English veterinarians claim that the disease was carried to England by American horses, and it has been the cause of considerable excitement in the old country. It is said to be contagious.

Symptoms.—A medium-sized, well-defined, and rather hard and irritable pustule makes its appearance over the body. After a while the pustule, having arrived at a fully developed state, bursts, and discharges a thin but sticky fluid of the colour of straw; after which an unhealthy-looking scab forms, which, after a considerable length of time, drops off, usually leaving an indentation or cicatrice.

Treatment.—Administer a purgative, stimulate all of the excretory organs to increased action so as to eliminate all effete material; give alteratives and tonics; locally use astringent and disinfectant lotions—such drugs as carbolic acid, creolin, chloride of zinc, or acetate of lead, being useful. Mercurial ointment, or a mixture of mercurial and zinc ointments, is good.

Rat-tails.—This consists of a sort of plastic inflammation of the dermis. There is an exudate of coagulable lymph; the papillary layer of the skin becomes more or less enlarged, and shows itself in transverse ridges, supposed to somewhat resemble rat-tails—hence the name. It occurs most frequently in connection with the hind limb. This condition is generally due to oft-repeated attacks of grease.

Treatment.—Give cathartics and diuretics, and use astringents and emollients locally.

Crusta Labialis. — This is an eczematous condition of the skin, and is said to be due to the action of grasses, reeds, etc., on the lips, and it may in some cases be due to faulty digestion or derangement of the digestive system. I have noticed that some horses are more subject to it than others, the mealy* bay horses suffering more frequently than horses of another colour (Smith).

Treatment.– Use any mild ointment or emollient containing some little astringent principle. Zinc or boric acid is very good, used either as ointments or in solution. The same condition occurs around the coronet, and is treated in the same way.

Eczema Rubrum.—An eczematous affection occurring amongst dogs, and more particularly amongst sporting dogs.

Causes.—Eczema rubrum is caused by improper attention to dieting the animal, as, for instance, feeding the animal upon the same kind of food for a long time. It may also be produced by allowing the dog to run through long grass when it is wet. Various deranged conditions of the digestive system will also cause it.

Symptoms.—Redness of the skin is observable along the belly, breast, back, etc. The parts feel hotter than natural, and are considerably irritated. There may be falling out of the hair in patches, and an ichorous discharge, slight excoriation of the parts, etc. There may also be a slight constitutional disturbance, as is evidenced by the presence of fever, loss of appetite, etc.

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* Horses light bay in colour, with very light-coloured muzzles.

Treatment.—The food should at once be changed. Give milk and porridge for a few days. In some cases lean meat alone is effectual as a dietary. A laxative should be given. Ungt. Hydrarg., Acid. Carbol., etc., may be used externally; the latter, however, must be used continuously for dogs and cats. A good mixture is Pot. Carb. ʒi., Sulph. Flor. ʒi., Adeps. ʒvi.—℥i.

Warts.—Warts may be defined to be abnormal growths, consisting of a thickening of the cuticle—a hypertrophied condition of the papillæ. They may occur upon any part or parts of the body, but are of more frequent occurrence about the head, neck, belly, sheath, lips, etc. They are very common amongst horses and cattle, in which animals they often occur in great numbers, and sometimes disappear without anything being done. 'Angle-berry' is another name, and a very common one, applied to warts. They occur in every variety of shape, and vary in size from the magnitude of a pea to that of a man's head. They sometimes possess a broad base, and at another time are met with possessing well-marked constricted necks. Sometimes the greater part of the skin may be covered with warts.

Causes.—It is not always an easy matter to account for the presence of a wart; however, a very trivial irritation, as a chafe from the harness, etc., may stimulate the skin to such an extent as to cause it to take on this hypertrophied condition. Highly stimulating diet is said to cause warts by producing a disordered state of the skin, but this is doubtful, as there are other causes with which we are not acquainted. Some varieties are highly contagious.

Treatment.—In cases where the presence of warts is due to the animal having been fed on a highly stimulating diet, a run at pasture may be highly beneficial, often causing them to disappear within a short time. In case the above measure fails, other methods must be tried. If the wart has a constricted neck, it is best removed by the knife or by the ecraseur, after ligaturing, as some of the warts are very vascular. In cases where a wart has a broad base, excision may be effected; but such warts have a tendency to grow again, hence it is a good plan to use a caustic, as 'Unguentum Arsenicalis,' as follows: Acid. Arsen. ʒi., Adeps ʒvi.—℥i.; to be used very carefully. It is a very common cancer ointment. Caustics are to be applied a day or two after excision, not before. Poultices and astringents are often useful; and give a run at grass, which will often effect a cure when everything else fails.*

MANGE

Definition.—Mange is an eruptive disease of the skin, characterized by more or less irritation, causing the subject to scratch. It is due to the presence of a parasite belonging to the family Sarcoptes, from two Greek words signifying 'flesh,' and 'to conceal.' It is also called scab, or scabies, itch, etc. It is transmissible from animal to animal, and from one species to another. It has affected man, and, to quote the words of Professor Smith, 'Many of my countrymen are quite familiar with its effects.' The Duke of Argyle, so the legend runs, out of the bountiful munificence of his heart and his purse, erected scratching-posts throughout his dominion, so that the peasant or wayfarer could stop and relieve his intolerable itching by having a good scratch. Thus it was that the duke proved himself to be a public benefactor, and thus it was that the ejaculation of 'God bless the Duke of Argyle!' came into common use, being heard occasionally even at the present day. The parasites burrow into the flesh, and occur in the horse, man, sheep, pigs and cattle, and are also common to many other small animals. Besides the sarcoptes there are 'dermatodectes,' signifying 'the skin,' and 'to prick.' The dermatodectes do not burrow beneath the skin, but simply hold on to and prick the skin. They are common to the ox, horse and sheep. Another variety is known as 'symbiotes.' They neither burrow nor prick the skin, but nevertheless cause considerable irritation, and are common to the horse and ox. So three genera of ectozoa, or external parasites, as mentioned above, affect the horse and ox in common. Certain conditions appear favourable to the attack and propagation of the sarcoptes equi. A horse poorly cared for, badly groomed, and in an unthrifty state generally is in a favourable condition for the reception of the parasites. The attack of the sarcoptes is at first slow, but having once fairly secured a start, they spread with great rapidity, irritating the skin and sometimes destroying the patient. The sarcoptes will live for a time on man, but die without propagating.

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* It is well known that some warts will disappear without any treatment whatever after a certain length of time. The warts, too—seen sometimes on the mouth of the dog are undoubtedly contagious, and contact of a raw surface, or a little blood from a freshly excised wart with a wound in the mucous membrane will with certainty cause a new wart to appear at the abraded spot (McFadyean and Hobday, *Journal of Comparative Pathology and Therapeutics*, vol. xii., p. 341; Penherthy, *ibid.*, p. 363).

The dermatodectes are less troublesome than the sarcoptes. The symbiotes are often found affecting the legs of horses, setting up irritation or itching, and causing the animal to scratch the parts. The above-mentioned parasites are those causing mange, although of the three families named, the sarcoptes is probably the one least often met with in mange, but most certainly it is the one causing the worst form of the disease; either variety may be conveyed from one animal to another by means of harness, saddles, clothing, etc. The symbiotes can in some cases be easily detected by the unaided eye, but for either of the other varieties a prolonged search with the aid of the microscope is often necessary. Mange often prevails to a considerable extent during war. It is not a very common disease among Canadian or American horses, and a great many diseased conditions of the skin are frequently improperly diagnosed and treated as mange, when in reality they are entirely different conditions that are present, and which require in consequence treatment altogether different to the method pursued in the treatment of mange. The parasites causing mange are never spontaneously generated, as is thought by many; on the contrary, the disease is caused in every instance by coming into contact with the affected animals, or infected clothing, harness, etc. At the same time, it should be remembered that dirty, badly-groomed, and badly-kept animals are more prone to receive the parasites, and, having received them, offer greater encouragement and fall an easier prey to their ravages than would well-kept and properly-cared-for animals.

Symptoms.—The first symptom noticed is itchiness; the animal scratches itself, and the coat presents an unthrifty appearance. Soon the hair falls out in patches, leaving corresponding bare patches of skin; this is usually noticed on the neck, about the edge of the mane, and on the quarters near the root of the tail. As time goes on, the bare spots increase in size and number, until the animal is almost entirely devoid of hair. A sort of straw-coloured exudation may now be seen also. The general health of the animal, after a considerable time, begins to suffer: he becomes emaciated, feverish, and in some cases death takes place. Mange, while accompanied by a great deal of irritation of the skin, is greatly exceeded in this respect by eczema. A recollection of this fact will assist very materially in making the differential diagnosis between the two diseases.

Treatment.—The first step to be taken in the treatment of mange is, of course, the removal of the cause—destroy the parasites. However, the destruction of the mange parasite is a matter more easily spoken of than effected. External applications should be used, and are, of course, of greater importance than constitutional treatment, though the latter may be necessary in some cases. One of the best applications is as follows: Acid. Carbol. ℥i., Aquæ O.i. This mixture must be used carefully, and not applied over the whole of the body at one time, but only over a part of the body. Wash the parts well with soap and tepid water before using the mixture. It is always good practice to have the animal clipped before making any application, and it is in many cases absolutely necessary. Ungt. Hydrarg. is also a useful application, but requires to be used with caution. Another recipe is as follows: Ol. Picis, Ol. Rapæ. Sulph. Flor., partes equales. This is a very old as well as a very useful recipe, and the only objection to its employment is, that it is rather unpleasant to use, gumming the hair and clogging up the pores. Another preparation highly thought of by many practitioners is the following: Sulph. Flor. ʒi.—ʒii., Adeps Præp. ʒvi.—℥i. Sulphur Iodide is also of very great value in the treatment of this, as well as many other skin diseases. The animal should be removed from the stall or place he has been occupying. Afterwards the place should be thoroughly cleansed by washing with hot water containing carbolic acid. The same method is to be pursued with the harness, clothing, etc.: probably the wisest plan is to destroy the clothing. By pursuing the above course all danger of contagion to another or the same animal will be obviated. External applications of some parasiticide must be made. Sulphur is the safest and one of the best mixed with either oil or lard and carbonate of potash. Creolin, izal, mercurial, and arsenical preparations are all efficacious, but it must not be forgotten that all these are more or less toxic in action, and must be applied with discretion. Oily preparations act more effectually than watery doses. They should be thoroughly applied with a brush, and washed off at intervals of five or six days. It is good practice to change applications occasionally. If the animal be debilitated, and in poor condition, it will be necessary to employ constitutional treatment in addition to the local remedies mentioned above. A laxative may be given, to be followed in turn by alteratives and tonics. The feeding should be generous, and when the animal is groomed, care must be taken that the brushes are not used elsewhere.

Mange in Cattle is manifested by about the same general symptoms as in the horse. It is not by any means uncommonly met with. The sarcoptic and dermatodectic varieties are the ones most commonly seen.

Treatment.—The treatment of mange in cattle is the same as for mange in the horse.

Mange in Dogs.—There are two varieties of mange in the dog, the sarcoptic and the dermodectic or follicular.

Follicular Mange is practically incurable. Temporary improvement can sometimes be effected, but a cure which has remained so for six months is a rarity. The best plan is usually to destroy the patient at once, especially if a large area of skin is involved. The disease may almost be said to be non-contagious, as the parasites lie deep down in the hair follicles. The first symptoms observed are redness of the skin and loss of hair; there is no marked irritation at this stage. At a subsequent period—it may be a few days, or some weeks, or even months—a number of pustules appear. These, upon being pricked or squeezed, exude a purulent fluid, which, if placed under the microscope, yields plenty of evidence in the shape of small flat, fish-like parasites with small stumpy legs on either side. The parasite has been likened in appearance to a tadpole, or, by others, to a thin sole. If very local, collodion, painted on after the surface has been thoroughly dried and cleansed by ether, has been used successfully, the idea being to exclude all access of air to the parasites. Strong creolin dressings have also been followed by beneficial results, as has also a mixture of creosote, caustic potash, and olive oil, but, as said before, the usual sequel is the lethal chamber. In the later stages the dog is continually shaking its body, and is unable to keep still, becoming very emaciated, covered with running sores, and a most miserable object. The smell from the body in this stage is very offensive, sickly, nauseous, and characteristic. Numerous cases are on record where the disease has been transmitted to man.

Sarcoptic Mange in Dog and Cat.—This is the commonest variety, and is very contagious. It can also be transmitted to man, and is due to a small sarcopt. It usually commences under the arms or on the head, and is characterized by continual scratchings. Presently, small bleeding sores appear, and in time, if neglected, the whole body becomes covered, the hair falling off. The body, too, is scurfy, and has a peculiar odour. The animal never gets any rest, and becomes emaciated, death from exhaustion not being at all an infrequent sequel. The treatment consists in removing the coat and washing the body with disinfectant soap, soda, and hot water containing creolin, taking care to dry thoroughly. Afterwards apply thoroughly some parasiticide, such as creolin or sulphur, in the form of ointment, or in watery or oily mixture, not forgetting with creolin or other toxic agents that the dog absorbs material very readily from the skin. Sulphur (1 part) and carbonate of potash (½ a part) made up into an ointment with lard (4 or 6 parts) is the safest for delicate dogs, a portion of whose bodies should only be dressed at a time. Carbolic acid should never be used for the dog or cat. With cats the head is usually first affected. Watery dressings must be used with the greatest care for them. It is safer to merely use sulphur ointment.

Scab in Sheep.—Scab, or scabies, is a very common affection in some countries, causing serious loss to sheep-owners. The parasites causing scab are the dermatodectes ovis.

Symptoms.—The condition is one easily detected, as the symptoms are very plain. Great itchiness is evinced by almost constant scratching on the part of the affected animal. The wool begins to fall off in patches, showing redness and inflammation of the skin, and sometimes a nasty sore is to be seen. The animal loses flesh and spirits, and becomes debilitated.

Treatment.—Dress the parts thoroughly with creolin lotion, in the proportion of acid one part to oil or water sixteen, or twenty parts; or, to save trouble and expense, where large numbers of sheep are affected, some of the patent sheep dips may be used, as some of them are of great excellence. The affected animals should at once be removed and kept apart from animals not so affected. Another remedy, which is strongly recommended, is as follows: Creasote ʒi., Methylated Spirit ʒxv., Water ℥xl.; or Creasote ʒi., Water ʒxx. The former is, however, the best formula. It may also be used in equine practice. Another good application is, Tobacco ʒi., Water O.i.; make an infusion. This is also excellent for the destruction of ticks, etc. White Hellebore ʒi. may also be added to the above if desired, making a very powerful and effectual application. Ungt. Hydrarg. is also of considerable efficacy, and highly thought of by some. Prophylactic measures consist in keeping the pens and stabling clean, fumigating, etc.; also in keeping healthy animals off infected pastures.

Ringworm.—This is another affection caused by a parasite belonging to the Cryptogama, *i.e.*, derived from the vegetable kingdom. It is called ringworm on account of the peculiar manner of its arrangement. The parasite is a species of fungus, of minute size, and the disorder is undoubtedly contagious. It attacks all animals, horses in good condition appearing to be fully as susceptible as horses in poor condition. The vitality of the parasite is very great, and in many cases it has been known to live for upwards of six months. Ringworm is communicable from one animal to another, and from animals to man.

Symptoms.—Small pimples appear on various parts of the body, usually about the head, neck, and loins. After a short time the hair begins to fall out, in many cases coming off in circular patches; and now, by using the glass, little elevations or ridges are discernible, the ridges, of course, being due to the attack of the parasite. The affection, unless checked, soon spreads over the whole of the body. There is a slight oozing out of fluid from the affected parts. In some cases the affection may be circumscribed in character, attacking and remaining confined to one part only. More particularly is this the case in the horse, in which animal it is easy to treat. In man, however, its cure is a matter of some difficulty.

Treatment.—Wash the parts well with soap and water, after which apply the following ointment: Iodi., Potass. Iodi., āā. ʒi., Adeps ʒvi.—℥i.; or in some cases the parts may be touched with Argent. Nit. Touch pretty freely, and then use the Unguentum Iodi. After handling the patient, the hands should be washed to obviate the danger of contracting the disease. In case the animal is debilitated, the use of tonics is indicated, as iron, arsenic, etc. Ung. Hydrarg. Bin. (1 in 15 or 20), or Ung. Hydrarg. Fort., 1 part; Sulphur Vivum, 1 part; Adipis 2 to 4 parts, applied once a day for three days, then washed off and reapplied a few days later if necessary, are most excellent remedies. The clothing of the affected animal should also be thoroughly disinfected. If a large surface is affected care must be taken with poisonous drugs, dressing certain parts only at one time.

Lousiness.—Lice in veterinary practice are of two kinds—first, the ordinary horse-lice, invited by a filthy condition of the animal, improper grooming, debility, etc.; secondly, poultry lice. These latter are smaller than the equine louse. Lice also affect the other animals, as cattle, etc., destroying fine coats, causing unthriftiness, etc.

Symptoms.—The presence of either variety of lice is easily detected. Considerable irritation is manifested by the animal scratching himself, a staring coat, a mangy appearance, and an unthrifty look generally, the itching seeming to be more severe about the root of the tail, mane, etc.; and on making a close examination, the parasites may be detected swarming over the body of the animal. Poultry lousiness is by no means unfrequent in horses standing near hen-houses. Sometimes the irritation of poultry lousiness is so great as to cause the animal, when tied, to break loose to scratch himself. The mane and tail fall out, and even slight inflammation may exist.

Treatment.—One of the best applications known for the destruction of either kind of lice is as follows: Staphisagriæ Sem. et Veratrum Alb., āā. ʒi., Aquæ Ci.; boil until the residue measures two quarts; apply freely to the skin. It is not necessary to use as powerful applications as those recommended for mange. Carbolic acid or creolin in oil or water are efficacious. Having the body of the animal nicely clipped, if the season of the year is suitable, is often all that is necessary. Poultry lice cause a great deal more irritation than the ordinary equine lice. It is astonishing how injurious poultry are to horses. Even though they do not communicate lice to them, they appear to be peculiarly harmful to horses, and should never be kept where horses are. Another precautionary measure consists in keeping the affected animal from coming into contact with animals not affected. The clothing, harness, etc., should also be washed with a weak solution of carbolic acid, and the stall or box occupied by the patient should be well washed or fumigated with sulphur or formaldehyde fumes.

Fly.—Often considerable irritation is caused by flies. There is a fly which very much resembles, and on a casual examination might easily be mistaken for, the common house-fly; it, however, differs to a slight extent, both in appearance and habits. There was, some years ago, great excitement over a so-called disease which suddenly appeared, affecting horses and cattle in large numbers, and was supposed to be contagious. The trouble was, however, on examination, found to be due to the attack of the abovementioned fly. They are most abundant during the months of August and September. They may be easily distinguished from the house-fly by the severity of their bite, which is often felt even when protected by pretty thick clothing, and sometimes even bringing blood. The body is also longer and slimmer than that of the common house-fly. They may come into the house at certain seasons. They are most abundant in low, wet places. The bite is very painful, and is probably slightly poisonous. These flies are more troublesome to cattle than to horses, and cause them to run into the water, after which they come out and stand in the sun, causing an irritation of the skin around the heels and the formation of abscesses, until the heels become each a mass of suppuration.

Treatment.—Wash the parts nicely, and use Ol. Lini, Ol. Picis, Tr. Benzoin., equal parts of each. Carbolic acid or creolin are highly useful. Keep the animal in during the day, and allow it to run at night. All animals, but particularly sheep, suffer now and then from the blow-fly. If there be a wound, or the animal is suffering from purpura hæmorrhagica, often the parts become fly-blown and maggots form. These should be removed as speedily as possible. In some parts of America the flies deposit their ova in the ear of the horse, even when the animal is perfectly healthy, free from wounds, etc., and considerable annoyance is caused thereby.

Preparations containing tar, tobacco, or arsenic will temporarily prevent the fly from settling again, but the two former have the disadvantage of discolouring the wool of sheep if used for that animal. Arsenical preparations must, of course, be used with discretion. Astringent, antiseptic, or emollient lotions are useful when fœtid or ulcerating wounds have been made.

CHAPTER VI

Diseases of the Eyes

SIMPLE OPHTHALMIA

BY the term 'ophthalmia' is meant an inflammation of the eyeball. It may be called traumatic ophthalmia, if the cause is an injury as in a large majority of cases. There is generally inflammation of the conjunctiva. There are, of course, cases where the inflammation is not confined to the conjunctiva, but involves more of the structure.

Causes.—Simple ophthalmia may be the result of an injury, inflicted either directly or indirectly; hence the causes are legion. A few may be enumerated as follows: a blow from a whip in the hands of a careless or cruel driver; the presence of a foreign body, as a grain of sand, a hay-seed, a bit of chaff, etc. The presence of a foreign body of minute size is sometimes very difficult to detect, and, when it is found, requires very careful work to remove it. Ammoniacal vapours or foul air in stables will irritate the eye and cause the trouble. Particularly does this cause operate where one or two horses are stabled with a number of cattle. A blow on the orbital arch will also sometimes cause simple ophthalmia. Extremes of heat and cold, as well as sudden alternations of temperature, excite or produce the trouble.

Symptoms.—A partial or complete closure of the eye is observed. There is a copious flow of tears. The eyelids (particularly the upper lid) are, in a large majority of cases, swollen to a considerable extent. In some few cases it is not swollen, but is much reddened and inflamed; and in other cases it becomes completely everted. On making an examination of the eyeball, it is found to be retracted as far as possible. The pupil is dilated, and the eye cannot bear sudden exposure to light. *The exudate, when the condition occurs as the result of an injury, radiates from the seat of the injury towards the circumference; while in periodic ophthalmia precisely the opposite takes place.* There is not much constitutional disturbance unless the injury to the eye be a pretty severe one. Small bloodvessels may be seen, as it were, forming in the conjunctiva. A very slight irritation will often produce simple ophthalmia. The flow of tears may, after a while, be followed by a discharge of a purulent character, which ceases after a while, and is in its turn succeeded by the appearance of an exudate—a film which appears to be external to the cornea, but is in reality between the layers of the cornea; and the result is the cornea becomes opaque. However, the exudate soon disappears by absorption, and the cornea and other parts usually resume their normal appearance and condition. In some few cases a trace of the exudate remains. The inflammatory action is always much greater in this form of ophthalmia than it is in periodic ophthalmia. Occasionally the sclerotic coat partakes of the inflammatory action, and partial or complete destruction of vision sometimes occurs. Simple ophthalmia is also said to occur in an epizöotic form. In such a case it is undoubtedly due to some atmospheric cause.

Treatment.—Simple ophthalmia occurs in the acute, subacute, and chronic forms, and according to the stage of the disease at the time of commencing treatment is the practitioner to be guided in his mode of treatment and choice of remedies. As a rule, the treatment is very simple and easy; and, if the case is taken in hand early, treatment is almost uniformly successful. A careful examination should be made, the exciting cause discovered, if possible, and removed. Having removed the cause, allay the irritation by the free use of warm or cold water. These applications should be made frequently, and at each time occupying an hour or so. If the irritation be due to the presence of a foreign body, which in some cases may be embedded, it is to be carefully removed. This, while by no means easy, may still be effected in various ways. If the irritation is due to foul air, etc., remove the animal to a well-ventilated box, free from ammoniacal vapours, etc. A slightly darkened box should be used to place the patient in. For allaying irritation cold water may be used in the summer, and warm water in the winter is the best. Cold or warm poultices or a wet cloth may be placed over the eye. If the pain be excessive, anodyne applications, as Tr. Opii, Belladonna, etc., may be used. In cases where there is no abrasion, an application consisting of Tr. Opii, Plumbi Acetas et Aqua, in the usual proportions, will be found beneficial. Such a mixture, however, should not be used where abrasions exist, as the resulting compound, meconate of lead, being insoluble, might produce as much trouble as the original irritant. Belladonna, externally and internally, is highly beneficial, and has a strong tendency to prevent, and even break up, adhesions. A very good lotion is as follows: Zinc. Sulph.: grs. iii.—grs. v.; Aquæ ʒi.; to this opium and belladonna may be added, if desired, as before stated, belladonna being highly useful where structural change is feared. A slight laxative, to be followed by diuretics, may be given. If winter, omit the purgative in all but exceptional cases, but give diuretics. If the trouble is caused by any foreign substance being embedded in the eyeball or the lid, remove with a small feather or silk handkerchief;* but in most of the cases where it is embedded it cannot be removed except by the forceps. Local inflammation in many cases can be quickly and effectually reduced by scarifying the parts; or a moderate abstraction of blood may be made by opening the angular vein, using a sharp (Syme's) abscess-knife for the purpose. The flow of blood will cease after a while of its own accord. The only trouble is that the blood often will not flow, instead of being hard to check. In such a case one must encourage the flow of blood, which may be done in various ways. Atropine may be used, if so desired, instead of belladonna, as above mentioned. It may be used in the proportion of Atropiæ Sulph., grs. ii.—iii., Aquæ ℥i. This may be applied by means of a camel-hair pencil, or, what is probably better, a hypodermic or other small syringe may be used, by means of which the solution may be easily forced into contact with the inflamed structures. After the inflammation is allayed, it becomes the task of the practitioner to direct his attention to the film or exudate between the layers of the cornea. The removal of this film is frequently attempted by quacks and other ignorant persons, who have a cruel, and worse than useless, practice of blowing powdered glass, alum, etc., into the eye, on the supposition that the film is external to the cornea, and that the glass will cut it, or the alum, by its corrosive action, will destroy it. For the removal of the exudate it is necessary to 'stimulate' the eye, a good recipe for the purpose being as follows: Argent. Nit. grs. iii.—grs. v.; Aquæ Dest. ℥i. Touch the parts occasionally, using a camel-hair pencil to apply it with. In some cases it may be necessary to touch the part with a pencil of Argent. Nit. Iodide of Potash may also be given internally. If ulceration of the cornea or other parts takes place, use silver nitrate as above to produce healthy action.

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* The eyeball and eyelids should first be painted with a solution of Cocaine or Eucaine (2 to 4 per cent.) applied by means of a camel-hair brush.

PERIODIC OPHTHALMIA

Definition.—A constitutional affection operating on the organ of vision, first attacking the internal structures, then gradually extending, attacking various structures in turn, until the whole of the eye becomes involved, the disease sooner or later terminating in loss of vision. The disease is known by a great number of names. It was spoken of by the old writers as 'moon-blindness' or 'moon-eyes,' as the moon in its changes was supposed to be the cause of the periodical recurrences which are characteristic of this affection. It is also known as 'constitutional ophthalmia,' which is by no means a bad name; 'gouty ophthalmia,' on the supposition that it is due to some gouty or rheumatic influence existing within the system. It has been called 'odontalgia,' under the mistaken notion that it was caused through dentition. It is also spoken of as 'hereditary ophthalmia' and 'specific ophthalmia,' both of which are very good names, as it is undoubtedly transmissible from the parents to the progeny, and it is equally certain that it is a specific disease. Periodic ophthalmia differs very materially in several important respects from simple ophthalmia. The disease is by no means uncommon even at the present day,* although less frequently met with than some years ago, when it was very common, and was very generally regarded and spoken of as the bane of horse-flesh. Attention to the common-sense rules of breeding and hygienic principles have done much towards, and may possibly at some time in the future complete, the extinction of periodic ophthalmia.

Causes.—The causes of periodic ophthalmia are somewhat obscure. Extremes of heat and cold serve as exciting causes, although in all probability there must exist within the system a predisposition to an attack; in other words, the disease must exist within the system in a latent form, and extreme heat, or cold, and other exciting causes only serve to develop and cause it to become manifest. Improperly-ventilated or badly-lighted stables, hard work, overheating, poor food, neglect, etc., where there is any tendency to the disease, either hereditary or otherwise, most certainly exert a powerful influence in the development and production of periodic ophthalmia. The primary stage of the disease may be characterized as the inflammatory or acute stage, or in some cases it occurs in the subacute form. During the next, or second stage, the inflammatory action begins to subside, and in five or six days the eye has regained almost its normal appearance, the duration of an attack usually being ten or fifteen days. The eye may not suffer another attack for four or five years, or it may be attacked again in four or five weeks. Ten or a dozen attacks may be undergone, and still the eye look pretty well and vision be retained. However, such is the case only where the inflammatory action during each attack is of a very mild character. On the other hand, one or two attacks of a very severe type may be sufficient to cause complete loss of vision. Complete or partial loss of vision, as the termination of periodic ophthalmia, is in every case but a question of time. It is claimed that Lexington, one of the greatest racehorses and sires America ever produced, went blind from severe exertion; but there can be no reasonable doubt that the trouble was periodic ophthalmia, simply developed by exertion. It is a significant fact in proof of this, and also that it is a hereditary trouble, that a large number of the progeny of Lexington became blind.

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* Large numbers of American and Canadian horses are now purchased by many English companies, and amongst these periodic ophthalmia is still common, although in English horses it is comparatively rarely met with.

Symptoms.—A peculiarity of periodic ophthalmia is the suddenness of the attack. The groom reports that he left the horse at night all right; in the morning he found one or both eyes swollen, sore, etc. (as a rule, but one eye is affected at a time), and he supposes the horse has a cold in his eye, or has got a hay-seed or some other foreign substance in it. The eye is intolerant of light, and is retracted within its socket, and on this account appears smaller than its fellow. There is a drooping of the eyelid, and a slightly reddened condition of the conjunctiva, but not nearly to such an extent as in simple ophthalmia. The cornea is dim in appearance, with a well-marked ring around it. Another sign is the unnatural contraction of the pupil, very well marked on exposing the eye to light. As the disease advances, the interior of the eye loses its brilliancy and transparency, and presents a sort of yellowish-brown appearance, which is hard to describe, but once seen will always afterwards be easily recognised. This appearance is caused by the exudate which has been thrown out. The iris is always affected to a degree depending on the severity of the inflammation. A purulent discharge from the eye, more or less abundant, takes place. The iris may adhere to the crystalline lens, after which atrophy of the eyeball begins. As the disease progresses, the eye clears up somewhat, and the exudate, before of a brownish hue, changes to a sort of grayish colour, and part of it becomes absorbed. This grayish deposit is usually in connection with the crystalline lens, and may be regarded as the forerunner or basis of a cataract. Another peculiarity of this affection is that in many cases, as soon as the attack ceases in one eye, the other eye becomes affected, and often the disease reappears in a month or so without any visible cause for the second attack. Again, a case may appear to be getting along finely, the eye improving rapidly, etc., when it will suddenly change, the intensity of the inflammation become augmented, and the eye in every respect worse than ever. *In examining as to soundness, a wrinkled eyelid covering an eye that appears smaller than its fellow is to be regarded with suspicion*, as in such a case the probabilities are that the eye has suffered from two or three attacks of periodic ophthalmia. In the early stage of the disease there is usually a slight increase of the animal temperature, the pulse may be slightly quickened, and the animal observed to be duller than usual. Slight loss of appetite may also be observed in some cases. As a rule, each succeeding attack is marked by increased severity, until loss of vision results, when, generally, the inflammatory action ceases, never to return. There are, however, some well authenticated cases in which the eye, having become completely disorganized by the disease, still continued to suffer from inflammatory attacks at periods varying more or less in regularity, and in the same way that it had suffered before loss of vision had taken place. Such cases, however, are very rare.

Treatment.—The treatment of periodic ophthalmia is anything but satisfactory, and, so far as our present state of knowledge goes, we know of no remedy that will cure the disease. Hence the treatment can only be palliative, and is adopted with the view only of mitigating the severity of the attack. Both constitutional and local remedies are to be employed for this purpose. The animal should be placed in a darkened box, to prevent the irritation that would otherwise be caused by the light. Give a moderate laxative or purgative, as the nature of the case seems to demand, after which the exhibition of diuretics (colchicum preferably) will be attended with benefit. Hot or cold applications to the eye, according to the season, will relieve irritation. After irritation is relieved, use belladonna, or its alkaloid atropine, freely as a local application, as well as giving it internally. Belladonna applied right over the eyeball is about the best remedial agent known, as besides relieving pain and irritability, it also tends to prevent adhesion. Its alkaloid atropine is equally efficacious, and may be used instead, in the proportion of Atropiæ Sulph. grs. iii.—iv.—v., Aquæ ℥i., to be applied once or twice daily. Atropine may also be given internally. Potassium nitrate or potassium iodide may be given in the usual doses in conjunction with colchicum. In cases where the pain is pretty severe, apply the ordinary mixture of Tr. Opii et Plumbi Acetas. Puncture of the cornea, as recommended by some practitioners, is not successful. Scarification and fomentations for some time after are often beneficial; but, as before stated, it is useless to treat the disease with a view of effecting a radical cure, as it is incurable, and usually terminates in cataract and blindness.

Cataract.—A cataract may be defined to be an opacity of the crystalline lens, or its capsule. In some cases a cataract may result from an injury to the eye, and occasionally appears without any previous appreciable irritation; but in a very large majority of cases it occurs as a result of periodic ophthalmia. Cataracts vary in size, shape, and situation, and are of various kinds, as the false cataract, which consists of a deposition of lymph on the anterior capsule, in which case the lens is not affected, and removal of the deposit will be effected by absorption. True cataracts are *capsular* and *lenticular*, or *capsulo-lenticular*. *Capsular* is when the capsule is the seat of the cataract; *lenticular* is when the crystalline lens is affected; and when both the crystalline lens and its capsule are involved, it is known as a *capsulo-lenticular* cataract. Cataract is occasionally noticed in the young animal as soon as born, and is then known as congenital cataract. If cataract is well marked, it may be detected without the slightest difficulty. If the whole lens is affected, the eye will lose the power of vision, after which atrophy of the eyeball soon follows. The pupillary opening loses its elliptical form, and becomes round and abnormally large.*

Symptoms.—As above stated, if the cataract be of good size, it may easily be detected. If it be, on the contrary, small, its detection is in many cases a pretty difficult matter. Where a small cataract exists, on examination, the eye is noticed to be retracted, and the pupil, on sudden exposure to light, is noticed to contract to an unnatural degree. In some cases the cataract may be imperceptible on account of the minuteness of its size. In such a case, the animal is to be placed in a darkened box, and the eye examined with the aid of artificial light, as a candle, and, if necessary, an ophthalmoscope. The use of the ophthalmoscope, however, requires practice and expertness, and unless the practitioner be possessed of both, the ophthalmoscope will be more of a hindrance than an aid in the examination. At the same time it should be borne in mind that in some cases the presence of a very small cataract cannot be detected without the aid of this instrument, as the *catoptric test*, while being nearly always sufficient, will occasionally fail to reveal the presence of a very small cataract. After dilating the pupil with belladonna or atropine, and placing the horse in a darkened box, examine the eye by aid of candle-light. In many cases the cataract will at once be seen. The person making the examination should be careful to keep concealed any bright object which he may have about his dress, such as a scarf pin, bright button, or other article likely to cause a reflection from the eye of the patient, and thereby mislead the examiner.* The test may be applied without using belladonna. In such cases the practitioner should notice the amount of contraction of the pupil, and compare it with its fellow of the opposite side. Also, if the eye be healthy, the images or reflections of the lighted candle may be observed as follows: On moving the light from side to side, there may be observed an erect image, which is reflected from the surface of the cornea. This image moves in the same direction as the candle. A second image may also be seen, which is also erect, and moves in the same direction the candle moves in. This is reflected from the anterior surface of the crystalline lens. A third image, which is inverted, and moves in a direction opposite to that in which the candle is being moved, is seen reflected from the posterior surface of the lens. In the presence of cataract, the latter image (and sometimes the second one also) is rendered indistinct or wholly invisible. The eye may also be examined by taking the horse into the light, say to the stable-door, and placing a dark shade, as a hat, over his eye for a minute or two, after which remove it suddenly and observe the effect of the light on the pupillary openings both of the suspected and the sound eye, comparing the two. A cataract brought into view by the ophthalmoscope looks like a dark blue or almost black spot. Cataract may possibly be developed in ten or fifteen days, but it nearly always takes much longer.

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* To distinguish its presence place the animal in a doorway so that a good light falls directly on the face. The examiner then stands behind close to the horse's cheek, and whilst passing a black object (such as a book, hat, or coat-sleeve) over the cornea so as to make a shadow, closely examines the lens. A cataract, if present, appears either as a white, pearly spot on the lens, or sometimes as a dark body. It may be round, stellate, streaky, or of some other shape.

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* The ventilating holes in the crown of a hat have been known to cause a wrong opinion to be given.

Treatment is useless, as it is incurable in the horse. In the dog, too, operative interference is not very satisfactory.

AMAUROSIS

This condition is also known by the names 'gutta serena' and 'glass-eye,' and consists of a partial or complete loss of vision as a result of paralysis of the optic nerve and its terminal expansion, the retina, without there being much change in the appearance of the eye itself. Occasionally it coexists with cataract, and also with periodic ophthalmia. It also occurs sometimes as a symptom of certain diseases, as parturient apoplexy in the cow, and in the last stages of other diseases. It may be caused by injuries to the optic nerve, resulting from blows on the head, or standing in very dark stables for a long time—for this reason, horses after being down a coal-pit for a lengthened period become blind. It may be very quickly developed, and has been noticed as a result of hæmorrhage, and more particularly of secondary hæmorrhage. Amaurosis has often been noticed to occur in pregnant mares; in such cases it comes on a few days before foaling, and as a rule spontaneous recovery takes place within a few days after foaling.

Symptoms.—The principal symptom is the abnormally dilated condition of the pupillary opening, which loses its elliptical form and becomes round. The eye is prominent, bright, and has a peculiar glassy appearance. The vision is found to be impaired or totally lost; generally both eyes are affected simultaneously, except in cases where amaurosis is due to an injury affecting but one eye. The animal, when trotted out, steps along with an unnaturally high action, and carries his head in a peculiar position. Hence the name 'star-gazer' that is sometimes applied to such horses. The animal is very sensitive to sounds, pricking up his ears at the slightest noise. The pupillary opening fails to contract on sudden exposure to light.

Treatment.—If the case be undertaken at an early stage, the administration of nerve stimulants is to be tried, as nux vomica, or its alkaloid. Apply Eserine lotion (gr. i. to ℥i.) locally with a brush. Potassæ bromide is sometimes useful in the early stages. Electricity may be tried, but as a rule it is incurable. Keep patient in a dim light at first.

Glaucoma.—This condition is oftenest seen in old animals. The hyaloid membrane changes its condition, becomes of a bluish colour, and vision is very seriously interfered with, or completely destroyed. A few cases have come under observation where the animals when young had suffered from osteo-porosis, and glaucoma had occurred as a result. It may exist in connection with cataract.

Treatment.—The condition, being incurable, does not admit of treatment.

Fungus Hæmatodes.—This growth is also known by the names 'medullary sarcoma,' 'bleeding cancer,' etc. It may be defined to be a dark-coloured, highly vascular tumour of a cancerous nature. This formidable and malignant disease is fortunately very rare. It is occasionally associated with tuberculosis. The tumour, being removed, has a strong tendency to reappear, and, in fact, does reappear in nearly every case. It is most commonly seen in cattle.

Symptoms.—Slight irritation of the eye is noticed; there is a flow of tears; the cornea enlarges and bursts, as it were, and a small fungoid tumour makes its appearance, passes through the opening, grows rapidly, until it hangs down over the cheek, collecting dirt, etc.

Treatment.—Use the knife freely, remove the fungus, and if necessary the eyeball as well, and touch the parts with caustic potash, nitrate of silver, or the actual cautery. Restrain the hæmorrhage, which is usually excessive, by styptics, as Tr. Ferri, Plumb. Acet., or the actual cautery. The bones of the orbital cavity may be affected. To have the slightest chance of success, the operation must be performed as early as possible. All diseased structures in the neighbourhood are also to be removed. Prognosis is very unfavourable.

Staphyloma.—This disease consists of a protrusion of the cornea, or the formation of an elevation somewhat resembling a grape—hence the name. The disease is not generally of a malignant character. It occurs with much greater frequency among dogs than other animals.

Symptoms.—A bulging of the cornea is observed, caused by an abnormal increase of the aqueous humour (it is sometimes called dropsy of the eye). This bulging increases until the cornea, unable longer to resist the pressure, gives way, and allows the contained fluids to escape. Staphyloma is by no means a rare disease among cattle in Texas, being frequently met with there. Its cause is not known.

Treatment.—The protruding portion may be ligatured with fine silk. In some cases, to relieve pressure, it is useful to puncture the cornea. Non-irritating antiseptic lotions (such as Boracic Acid, 5 grains to the ounce, or Chinosol, 1 grain to the ounce), are valuable. Ulcers, etc., are to be treated with silver nitrate. Also use constitutional remedies, good food, etc., and keep the patient in the dark.

Laceration of the Cornea.—Laceration of the cornea may occur in various ways, allowing the aqueous humour to escape. However, the chances are, if it be a clean cut, that the cornea will heal and the aqueous humour be reproduced, if the animal be kept in a quiet place, slightly darkened, and moderately warm water and other warm applications are used. But if the cornea be badly lacerated or torn, inflammation will be set up, the wound will not heal properly, and the aqueous humour will not be reproduced, or only partially so. There usually remains a slight cicatrix, which as a rule does not interfere with vision, and should not affect the price of a horse unless in such a position as to interfere with the vision—that is, directly in front of the pupil. In examination, the animal may be passed as sound, so far as his eye is concerned, if the cicatrix is high up or low down, and more particularly if it is of long standing. In case there is a fungoid growth on the cornea after laceration, use Argent. Nit. grs. v., Aquæ ℥i.; hot and cold applications externally, Potass. Iodi. internally, etc.

Worm in the Eye.—Worm in the eye is of very rare occurrence on the American continent, but is very common in India, and occurs most frequently in low-lying, swampy situations, or in the neighbourhood of stagnant water. Two kinds of worms have been noticed inhabiting the eye, the 'filaria oculi' and the 'strongylus equinus.' The parasites vary from half an inch to about two inches in length, and reach the eye by means of the circulation, being first taken into the stomach of the animal along with the water he drinks, either as fully developed parasites or as ova—most probably the latter. After reaching the eye, the parasite develops and grows very rapidly.

Symptoms.—Worm in the eye is easily diagnosed, the symptoms being very plain. When the trouble has reached a certain stage, or the worm has attained a certain size, it begins to move about, and sets up considerable irritation. The first symptom noticed, as a rule, by the owner or attendant of the horse, is a haziness of the eye and a slight flow of tears. This leads to an examination, when he fancies he can see something like a thread in the eye. It moves about through the aqueous humour very quickly, in a manner likened to the movements of an eel in a basin of water, first in the anterior chamber, then in the posterior chamber, coming and going from the sight very quickly. If allowed to remain for any length of time and attain a complete state of development, loss of vision will usually result; although there are a few cases on record in which the worm died and became absorbed. The irritation increases if the worm is not removed, more or less opacity of the cornea is soon observed, and the animal at times shows that he is in considerable pain.

Treatment.—The only method by which the worm can be removed from the eye is by means of a surgical operation, consisting of an incision or puncture through the cornea, allowing the aqueous humour and the worm with it to pass out. In the majority of cases the patient will need no preparation for the operation. In every case the animal is to be cast, and firmly secured. Elevate the head to a certain extent, placing it in a position convenient for operating on the eye. Transfix the membrana nictitans with a tenaculum or some other suitable instrument. For making the incision, use a sharp lancet, such as is used in human practice. Have it guarded, so as to expose only so much of the point as is necessary, by wrapping it with thread. Make an incision through the cornea, passing the lancet as quickly as possible. As soon as the incision is made, the aqueous humour will escape pretty forcibly, and, as a rule, the parasite comes out with it. In case the worm does not escape with the aqueous humour, place the animal in a darkened box, and keep him quiet for a few days, until the aqueous humour reaccumulates; after which operate again. In case the worm can be removed in no other way, it becomes advisable to pass a pair of microscopic forceps into the chamber, seize the parasite, and remove it. The incision should be made at the superior part of the cornea, at its junction with the sclerotica, and in a slanting direction, to have it heal rapidly.

Myopia (or Near-sightedness).—This condition is caused by an abnormal condition of the eyeball, which becomes elongated from before backwards, and too great convexity of the crystalline lens, and probably also of the cornea. It causes shying, etc. In some cases it may wear away as the animal grows older. In man this defect is remedied by using concave glasses; but as it is not possible to remedy the defect in the lower animals by applying glasses, and as no other remedial measure is known, it is usual to let the animal go without treatment.

Hypermetropia.—This is the opposite condition to the one above described, and constitutes far-sightedness. It is remedied in man by the use of convex glasses. The other remarks made in regard to treatment, etc., of myopia, will also apply to this condition.

Ossification of the Eyeball.—Cases have been noticed where the eye has become ossified.

Calcareous Growths, Osseous Deposits, and Melanotic Deposits also are noticed in connection with the eyeball, the latter occurring chiefly in gray horses, the vitreous humour being the portion of the eye affected. None of these conditions are curable.

Ulceration of the Cornea.—Ulceration of the cornea occurs more frequently among dogs than among other animals, being in dogs a very common result of distemper. It gives the eye a very unsightly appearance, besides causing considerable irritation and annoyance to the animal.

Treatment.—Touch the ulcer twice daily with some stimulating application, as Argenti Nitras grs. v.—x., et Aquæ ℥i. Antiseptics, such as Chinosol (gr. i. to ℥i.), or Boracic Acid (grs. v.—x., to ℥i.), are useful. Give a good nourishing diet in proper quantities. Alternatives and tonics, as arsenic or quinine, may also be given with beneficial results.

Dislocation of the Eyeball.—Dislocation of the eyeball may occur in various ways, and in any animal; but occurs oftenest in the dog, and usually through fighting.

Treatment.—If seen at once, there is a possibility of returning and keeping the eyeball in its place, and by judicious use of bandages, cold water, etc., effecting a cure, but in case the injury is not discovered for an hour or two, and the eyeball is found to be perfectly cold, the circulation having ceased, a cure cannot be made, and there is no recourse but to remove the eyeball.

Injuries to the Upper Eyelid.—Injuries to the upper eyelid may happen in several ways—as by animals fighting, or striking a hook or nail, and lacerating the lid.

Treatment.—It is advisable to be as conservative as possible in a case of this kind. Bring the lacerated edges together, taking care that they are in perfect apposition. Save the torn parts as much as possible, cutting away nothing that can be retained. In suturing, use fine silk or gut, and a small needle, such as is used in human surgery. Having brought the parts together, prescribe cold-water dressings if it is during summer-time, or warm water if it is in the winter-time. Order the animal to be tied in such a way as to prevent him being able to scratch the part or bring it into contact with any hard substance, otherwise he will be likely to scratch and reopen the wound.* The ordinary cooling and astringent lotions may be used afterwards. Occasionally after such an injury there may be slight opacity of the cornea.

Membrana Nictitans.—Irritation or inflammation of the membrana nictitans sometimes comes under notice, being manifested by swelling, redness, etc.

Treatment.—Use warm applications, as poultices, fomentations, etc., to allay irritation; after which cold applications will be useful. If necessary excise the membrana.

Membrana Nictitans (Ulceration of).—Ulceration of the membrana nictitans constitutes a troublesome condition, and in cases where it becomes diseased to such an extent that it cannot be healed, it becomes necessary to remove a portion; or in certain severe cases it may be necessary to remove the whole of it. It should not be removed except in extreme cases, although there is rarely any trouble afterwards. It is then to be removed with scissors or knife, after having first secured the membrana with a hook, tenaculum, or other suitable instrument.

Ductus Lachrymalis.—The most common disease of this duct is thickening of the mucous membrane; or obstruction of the duct may exist from some other cause.

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* For a horse place on the pillar reins; for a dog bandage and muzzle. If, however, the wound is rendered antiseptic and afterwards covered with a film of iodoform and collodion (1 to 10) or orthoform and collodion (1 to 8), it is most rare for any sign of irritation to be shown.

Symptoms.—The symptoms are very plain, to one who is acquainted with the situation and functions of the duct. There is considerable irritation of the eye, and a flow of tears which excoriate the cheek, causing the hair to fall out. There may also be a discharge of pus, which collects at the inner canthus. On elevating the head, the pus will be observed, as a rule, to flow backwards.

Treatment.—The duct is to be injected. Some attempt to inject it from above. This is, however, very difficult, and is usually a failure. The best and most effectual way is to inject the duct from its lower opening, which is situated in the false nostril. Use a syringe, preferably of hard rubber; using tepid water for the first injection, after which a mild astringent may be injected, as Zinci Sulphas grs. v., Aquæ ℥i. In some cases a fine wire probe can be passed.

Imperforate Duct.—This is congenital. In most cases the colt is a couple of years old before professional advice is sought respecting the trouble.

Symptoms.—There is considerable irritation present, accompanied by a flow of tears, and a purulent discharge which runs freely over the cheek when the head is elevated; and, on making an examination, it is found that there is no duct, or that the opening is closed by mucous membrane. For the former condition, as a rule, nothing can be done, except that an artificial opening may be made, allowing the tears to flow out over the cheek. If closed with mucous secretion, pass a special probe, if possible.

Ectropium, or Eversion of the Eyelid.—This condition is common amongst dogs, and occurs as a result of distemper.

Treatment.—The treatment consists of scarifying the conjunctiva, after which caustics are to be applied at intervals of three or four days. Where this treatment fails, it becomes necessary to excise an elliptical-shaped portion of the conjunctival membrane, using the curved scissors for the purpose, after which use fomentations, astringents, etc.

Entropium, or Inversion of the Eyelid.—This is exactly the opposite of ectropium, the eyelid being doubled in instead of turned outwards.

Treatment.—A portion of the skin of the eyelid must be excised in such a manner as to remove the surplus, so that when the wound heals the eyelid will be effectually retained in its proper place.

Trichiasis.—The eyelashes grow inwards, irritating the eye. Districhiasis is the opposite condition. Treat the same as entropium.

CHAPTER VII

Diseases of the Nervous System

ENCEPHALITIS

Definition.—Inflammation of the brain as a whole. The condition is also known as phrenitis, which is not such a good name, except that it describes the symptoms better, the animal as a rule being frenzied or furious. It may not be out of place to remark here that some of the very obscure diseases of cattle, sheep, and pigs, if examined carefully, would probably prove to be affections of the nervous system.

Causes.—The causes of encephalitis are not always apparent. However, it occurs sometimes as a result of an injury, as a concussion, causing congestion and inflammation of the brain. Exposure to the sun, more particularly if the animal has suffered previously from sunstroke, will cause the malady. It may be owing in some cases to the character of the food. In some instances it is developed without any appreciable cause. In all cases the practitioner should endeavour to find out the cause of the trouble if possible. Over-ripe grasses will produce it, as will decomposing roots, as, for instance, where the roots lie in a cellar all winter and are fed to the stock in the spring of the year. The disease may also occur as a result of eating weeds or plants possessing narcotic properties. In Great Britain, horses, at certain seasons of the year, are fed on rye-grasses, and in consequence brain diseases are very common where the rye-grass is over-ripe and taken in excessive quantities. Buckwheat will also produce it, as will mouldy or bad food of any kind, especially if given for any length of time or in large quantities. Tumours or abscesses forming in the brain, as a result of irregular strangles, melanotic deposits, etc., are also causes of encephalitis.

Symptoms.—The symptoms vary to a considerable extent. In most cases there is marked dulness, which generally increases as the disease progresses. The animal assumes a dull, listless attitude, but is easily excited by a little noise, after which he soon relapses into his former dull, sleepy mood. The urine is scant in quantity; the bowels are constipated; the respirations slow, and often stertorous in character. As a rule, the pulsations are fewer in number than in health, sometimes running down to thirty, or even as low as twenty-six beats per minute. In other cases, in addition to the dulness above described, the animal has occasional convulsions, manifested by slight trismus and the projection of the membrana nictitans. 'Some cases have come under my observation that, during the early stages, I thought were going to be well-marked cases of tetanus' (Smith). When standing quietly in the box, he shows a strong inclination to rest his head against the wall or the manger. In other cases, the breathing becomes stertorous, the pulse becomes accelerated, the eyes bloodshot, and the poor animal, in a state of frenzy, will knock himself about in the most violent manner, and without the least regard for the life of himself or those about him. Sometimes the animal will lie on his side and keep pawing for hours. At other times he will try to place his fore-leg over his head, or may stand hanging his head until his muzzle comes into contact with the ground. Again, he will raise his head, rear up, and make frantic attempts to climb up the wall or manger. In other cases he will persistently walk in a circle for hours together, and no amount of persuasion or force will induce him to go in any other direction; in fact, the animal seems totally incapable of walking in a straight line. The frenzy is well-marked, and when present he bites and tears at everything within reach. It is very different, however, to the frenzy of rabies.

Post-mortem appearances vary. In some cases there is no sign present except well-marked congestion of the meninges of the brain, where frenzy has been a prominent symptom, or the brain itself may be congested.

Pigs fed on refuse from the kitchen, and cows fed on slops, or either of them fed on too rich food, also suffer with encephalitis. Over-ripe grasses will also cause it in cattle. An admixture of carrots in the food tends to prevent the vile effects of too rich food.

Treatment.—The treatment varies, but, as a rule, an active cathartic is to be given, as the following: Aloes Barb. ʒvi.—viii.; Hydrarg. Subchlor. ʒi. The latter is to hasten the action of the aloes. In some cases, where the patient is a very large animal, aloes ʒx. may be given. Apply cold water, pounded ice, etc., in a bag to the head. A good dose of physic is of great benefit, but only in the earliest stages of the malady. The same may be said of blood-letting. Belladonna and bromide of potassium are useful, given in the largest doses, the latter remedy being the most useful of the two. The animal should be placed in a large yard or a padded box, to guard against injury. The prognosis, as a rule, is unfavourable, but the practitioner should not be in too great a hurry to give up the case, as in numbers of cases seemingly hopeless recoveries are made that are almost miraculous. When the bowels begin to act freely, there is a good chance of recovery; hence, no matter how violent the frenzy of the animal may be, the case should never be abandoned. A pretty strong pulse is also to be regarded as a favourable symptom. If the body becomes covered with a cold sweat, the eyes amaurotic, etc., it may be said with confidence that the animal will die, and more especially if he has been affected for some time. If the patient is lying down, have his general comfort attended to. Pad him up, and turn him from side to side occasionally. Give fresh, cold, and pure water and fresh air in abundance, and endeavour to combat each symptom as it presents itself.

SUNSTROKE

Sunstroke occurs with greatest frequency in warm countries, and [illegible] hot weather. About fourteen or fifteen years ago a great many horses died from sunstroke on the American continent. It is a greater or less congestion of the brain, causing either partial or complete loss of motion, and often of sensation. The predisposing causes are high feeding or a highly stimulating diet; irregular exercise; an insufficient supply of good water, badly-ventilated stables, etc. Debility may also be mentioned as a predisposing cause. The immediate cause is exposure to the sun during very hot weather, as in August, and more especially if the animal is doing heavy work, or is put to severe exertion of any kind. An animal in perfect health and condition may be attacked, but is not nearly so likely to suffer as an animal debilitated from any cause whatever.

Symptoms.—Generally before the trouble becomes well marked, that is, before the acute stage is reached, certain premonitory symptoms are observed, as an unusual dulness and languor on the part of the animal, and, as a rule, he does not perspire as he should when put to exertion. The temperature rises to 105° or 106°, and may even reach 110°; a slightly reeling action is noticed when the animal walks. This action becomes better marked as the disease progresses, until the animal, no longer able to stand, falls; and when down extends the head. Soon complete loss of motion takes place, and there may be in many cases an amaurotic stare, loss of vision, etc. On lifting the leg, not the slightest resistance is offered; the breathing is stertorous, etc.

Treatment.—The treatment of a case of sunstroke, to be successful, must be prompt and energetic. If the power of deglutition still remains, administer a stimulant, as ale, beer, wine, whisky, nitrous æther, etc.; to be given in the usual quantities. Great care must be exercised in administering a draught, or asphyxia may result. Apply refrigerants, as pounded ice, cold water, etc., to the animal's head, and heat the body by clothing pretty heavily, etc. It is very essential that the head be kept cold and the body warm, and that stimulants be administered at proper intervals and in judicious quantities. If the power of deglutition be gone, stimulants may be administered per rectum, in the form of an enema. If the animal be lying exposed to the rays of the sun, an awning must be erected over him for protection. Rub the legs and body vigorously, and use hot applications on the extremities. If he recovers sufficiently to get on his feet, he will go reeling and staggering along from side to side when he attempts to walk, and it may be necessary to place him in slings to obviate the danger of falling and injuring himself. After he is placed in the sling, administer a full dose of cathartic medicine, and give potassium bromide, when sometimes a complete recovery will take place. In cases that are going to terminate fatally the patient falls into a lethargic condition, which is soon followed by convulsions and death. When he is down, enemas should be freely given. The patient should be placed so as to rest on his sternum, and supported in that position by bundles of straw, etc. An attack may be warded off, when coming on, by rest, a stimulant, cool water to drink, shade, etc.

CONCUSSION OF THE BRAIN

Concussion of the brain may take place in any animal, and occurs in a variety of ways. In the horse it is usually caused by the animal running away and striking the head against some hard object in a violent manner, rearing up and falling backwards, passing through a low doorway, kicks, etc. Sometimes the cranial bones are fractured and death soon ensues. And in cases where the basilar process of the occipital bone is fractured, death takes place almost instantaneously.

Symptoms.—In concussion of the brain, complete loss of motor-power and sensibility takes place. The practitioner is usually informed that the animal has run away, fallen, and is unable to rise. The pupillary opening is found, on examination, to be dilated ; the pulse is often indistinct, the temperature of the body-surface is considerably lower than in health ; the breathing is stertorous in character, and the animal is totally unconscious of all that is going on around him. In many cases the patient will in an hour or so exhibit signs of returning consciousness, and usually makes an effort to rise. He gets his forelegs under him and tries to get up exactly like a cow, hind-legs first. If the brain is much affected by concussion, there will be loss of power involving the whole body. If the injury affects the spinal cord behind the brain, loss of motor-power is referable only to those parts situated posterior to the seat of injury. If the pulse is strong, pretty good hopes of recovery may be entertained, and in such a case recovery may take place in a few hours, or within a few minutes even.

Treatment.—The treatment of concussion of the brain is similar to that of sunstroke—cold applications to the head and warm to the body and extremities. Prop the patient up on his sternum, or sling him, as seems advisable. In some cases relief is only temporary; there may be a fracture, which is difficult to detect. Give stimulants and enemas, and bandage the legs, etc. Now and then the practitioner meets with a case of concussion of the brain where the patient will stand with his head hanging down until the muzzle almost touches the ground, and mechanical congestion of the lips takes places. Treat such a case by scarifying the lips, and keep the head elevated by means of a web. If a fractured portion of bone can be detected to be pressing on the brain, this must be raised with an elevator or removed by trephining.

VERTIGO

Synonyms: **Megrims, Head-staggers, etc.**—The disease has received the above names in reference to the erratic movements of the animal when labouring under an attack. In some cases it is due to temporary congestion of the brain; on the contrary, it may also be caused by an anæmic condition of the brain; and it may result from the presence of cerebral tumours; any disease of the brain or heart, or anything that interferes with the flow of blood to or from the heart or brain. Conformation may have something to do with the trouble also. Horses with short, upright necks are more likely to suffer, and horses doing heavy collar-work frequently suffer. Tight-reining may also excite an attack. Nervous horses are more subject to it than others. As a rule it is due to some lesion of the brain, but it is not so easy to say what that lesion is. It is often due to some organic change. Over-study causes the trouble in man. Gastric derangement also figures as a cause of vertigo. Some animals are predisposed to it, and such often have a peculiar appearance of wildness, and are easily excited.

Symptoms.—The peculiarity of vertigo is the suddenness of the attack. While being driven, the animal stops, falters in his action, elevates his head, staggers about from one side of the road to the other, becomes perfectly unmanageable, and finally falls to the ground; lies there awhile, then gets up, stares about him in a vacant manner, shakes himself, and apparently is all right again. He is a very dangerous animal to possess, as the trouble is liable to come on at any time without the slightest premonitory symptom, and he may fall and kill someone. It is oftener noticed in harness horses than in any other kind, and may be due to pressure of the collar on a bloodvessel. Sometimes premonitory symptoms are presented, as for a day or two the animal appears languid, etc.

Treatment.—Endeavour to ascertain the cause; if it is a badly fitting collar, remedy it. Give a laxative, and one or two good doses of potassium bromide. Some animals never have but one attack. When attacked two or three times it may be known that he is subject to it, and is an extremely dangerous animal to ride or drive. Diet must be regularly given and sparing in quantity; avoid using the animal immediately after a meal. Give laxatives occasionally.

APOPLEXY

This disease is not very often met with in the horse, and is now and then the cause of death when it does occur. In the dog it is also seen, but occurs with greatest frequency amongst pigs, as they take on fat very rapidly, and eat large quantities of food, which tends to weaken the bloodvessels. It may be due to the formation of a small blood-clot in the circulation. Apoplexy is most common in fat animals not getting much exercise, as pigs and pampered dogs.

Pathology.—It is due to arrest of the circulation of the blood in the brain, and there may possibly be rupture of some of the small bloodvessels of the part, and extravasation of blood.

Symptoms.—Apoplexy is characterized by the suddenness of its attack. The animal exhibits more or less cerebral disturbance, the pupil is dilated, the breathing is stertorous. Sometimes paraplegia or hemiplegia accompanies the attack. As a rule, there is complete unconsciousness.

Post-mortem.—Reveals congestion of the brain, ruptured bloodvessels, and extravasation of blood.

Treatment.—Frequent changes of food are beneficial. A dose or two of sodium hyposulphite may be given. Apply cold to the head during the attack, and, if the patient be a horse, a pretty copious abstraction of blood may be attended with benefit. The administration of a few full doses of potassium bromide will be found very useful. Apoplexy is far likelier to occur in stallions than in mares or geldings, for the reason that they are more excitable, are oftener excited, and have to sustain a severe strain on the nervous system. They are also very highly fed, and on a very stimulating diet, and, generally speaking, are more predisposed.

EPILEPSY

This disease is occasionally observed in the horse, but is of more frequent occurrence amongst dogs, in which latter animal it is generally referred to as 'fits.' In man, tobacco, alcoholic drinks, etc., tend to produce epileptic fits. In dogs the cause is intestinal derangement, as worms, indigestion, etc., or teething.

Symptoms.—The attack is marked by a convulsive fit. The patient falls to the ground, froths at the mouth, etc., the attack lasting for three or four minutes, after which he rises, walks about in a dull manner, and in a short time is apparently all right.

Treatment.—Everything should be done to insure the patient a full supply of fresh air. A piece of wood, or similar substance, should be inserted between the teeth to prevent them being injured, or the tongue bitten. After the attack has passed off a purgative should be given. Vomiting will ensue sometimes, more especially if the patient be a dog, in which case worms are often vomited up. Potassium or strontium bromides are the best drugs to administer for a while, the patient being kept free from excitement. Then follow up by a purgative or vermifuge to remove the exciting cause, if that can be detected. Diet carefully.

TETANUS

Tetanus is a by no means uncommon disease, coming under the notice of the practitioner pretty frequently. It is due to the entrance into the system, through some abrasion, of the tetanus bacillus, and is characterized by a tonic contraction of the voluntary muscles. The variety known as trismus, or lockjaw, is characterized by contraction of the muscles of the jaws. In trismus, when well marked, the masseter muscles are so firmly contracted that it is impossible to get anything between the tightly-clenched teeth. In all cases, and in every variety of tetanus, it is probable that the whole muscular system is more or less implicated, but of course some muscles more than others. Tetanus is a very appropriate name, as it signifies 'to stretch.'

Opisthotonos.—This is the name used to designate the variety of tetanus wherein the muscles of the back are rigidly contracted, and the head and tail carried erect. Another variety is **Emprosthotonos.** This condition is exactly the opposite of the one previously described, as the muscles of the belly are rigidly contracted, and the head is depressed by contraction of the inferior cervical muscles.

Pleurosthotonos (or trismus lateralis) is when the head and neck are pulled around to one side, by virtue of the contraction of the muscles of that side.

Tetanus used to be divided into two headings, 'traumatic' and 'idiopathic.' It was said to be 'traumatic tetanus' when due to an injury, and when the disease occurs without any appreciable cause it was known as 'idiopathic tetanus.' The latter form was put down as the result of irritation caused by parasites, worms, etc., in the intestines, or to be the result of gastric irritation of various kinds. Often tetanus will follow a very simple injury. The bacillus of tetanus may gain entrance through an abrasion, so slight that it cannot be discovered. Such a case used to be called 'idiopathic,' while in reality it would be a case of 'traumatic tetanus.'

The disease is far more common in hot than in cold climates, and more so where there are extremes of heat and cold. In certain localities animals will suffer from tetanus resulting from the most trivial wounds; indeed, to such an extent does it prevail in some places, that it might almost be described as enzöotic. Tetanus most frequently follows wounds of that part of the body which comes in contact with the ground, and manifests itself, as a rule, about the time the wound is healing, or is nearly well.* It occasionally supervenes on castration, and about the ninth or tenth day, when the wound is healing nicely, is when the disease makes its appearance. The person who performed the operation is usually blamed, but unjustly, however, as tetanus will often follow this operation, no matter how it has been performed, whether properly or otherwise. After castration, the animal should not be allowed to take cold, or be put in a dusty, dirty place. If he is exposed in this way, he has a pretty good chance of suffering from tetanus. Percivall mentions that out of twenty-four horses castrated in one day, and exposed in the way above mentioned, sixteen of them contracted the disease. Tetanus is one of the most fatal diseases with which the veterinarian has to deal.

Post-mortem.—The muscles, after death, have a peculiarly soft, flabby feeling. The sheaths of the nerves present well-marked traces of congestion. Sometimes effusion is observable in connection with the brain and spinal cord, but more often nothing at all can be discovered.

Symptoms.—After the disease has attained a certain stage, it is very easily diagnosed. At first, however, when the premonitory symptoms are presenting themselves, especially if it is going to be a mild case, it is slightly difficult to diagnose, unless the practitioner has had considerable experience with the disease, and is well acquainted with its nature.

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* The bacillus of tetanus is most frequently to be found in the dust of roads and in garden earth. This explains why tetanus so commonly supervenes on wounded knees, wounds of the feet or other parts (such as the scrotum), which come frequently in contact with the ground.

There is more or less contraction of the muscles and stiffness about the injured part if it is due to an injury. Most commonly the first symptom noticed is contraction of the muscles of the head and neck. The nose is poked out, the head being held in a peculiarly stiff and uncomfortable position, something similar to the position assumed in a case of acute laryngitis. There is a slight dribbling of saliva from the mouth. The course of the levator humeri muscle is well defined, the muscle standing out very prominently, and, on being felt, is found to be as rigid and unyielding as a piece of granite. The other muscles can be traced also in their course, but are much less prominent than the one spoken of. The patient is very easily excited, and if struck or pulled to one side, a convulsion of more or less severity ensues. The head and tail are quickly elevated, the animal trembles all over, the membrana nictitans passes over the eyeball, in some cases to such an extent as to almost completely obscure the eyeball. *Also, on elevating the head, or in any way exciting the patient, the membrana nictitans is at once projected and the nostrils become dilated.* The animal stands in a peculiarly stiff position, with his fore-legs extending forwards and his hind-legs extending backwards, and the legs are held wider apart than usual, as though the patient was afraid of falling, and had, as it were, propped himself up. It seems as though the feet are rooted to the ground. The animal will not willingly move, and when he does, it is only with the greatest difficulty. The pulse varies to a remarkable extent in frequency, in some cases being forty-five or normal, in other cases running up as high as eighty. If excited, the pulse at once runs up. The countenance bears a very anxious or distressed appearance. The ears are usually pricked up, to a certain extent as a result of sympathy with the rest of the muscular system. The jaws, on examination, are found to be rigid and immovable, and as the breathing is often affected to a considerable extent, the probabilities are that the diaphragm is involved. In most cases the appetite is retained, but of course mastication is impossible, on account of spasm of the masseters, and usually there is great difficulty in deglutition. The bowels are constipated, and the urine is scant in quantity and high in colour. If the animal lies, or falls down, all the symptoms enumerated become aggravated to a terrible degree. The breathing becomes extremely difficult. The patient paws and struggles for hours at a time in the most frantic manner, until the body becomes bathed, first with a warm sweat, then with a cold sweat, followed in a short time by death. In milder cases—and it occurs in every possible degree of severity—the above symptoms are present, but in a much milder form. The animal usually retains the standing posture, which is the best, as lying down aggravates the disease.

Treatment.—Almost every medicine in the Pharmacopœia has been tried in the treatment of tetanus, certain remedies meeting with great success in the hands of some practitioners, and proving total failures in the hands of others. It is, however, generally admitted by the members of the profession that *perfect quietude* is the greatest essential in the treatment of tetanus. Place the patient in a dry, well ventilated loose-box, slightly darkened, if possible, in an out-of-the-way situation, and fill the ears with cotton-wool. Administer a full dose of cathartic medicine, and follow with belladonna in a draught of bolus. Place the medicine well back on the tongue, and as a rule the patient will suck it in. The body should be lightly clothed, and the animal placed in slings.* Never give a draught if it produces excitement. When the wound can be discovered, powerful antiseptics should be continually applied to its lowest depths.* Arsenious acid, chloroform, hyoscyamus, digitalis, belladonna, chloral hydrate, morphia, conine, curare or woorari, potassium bromide, nicotine, and many other agents, have been used, and some of them have been found beneficial. Belladonna is probably as good as any, and should be given freely. Bromide of potassium is also of benefit. Inhalations of chloroform temporarily abate spasm, but the reaction afterwards is usually severe. Medicines which can be given in the drinking-water may be administered in that way. The food should consist of milk, eggs, beef-tea, wine, gruel, and food of that description, easily taken and of a very nutritious character. Too great care or attention cannot possibly be bestowed upon the animal. The after-treatment consists of allowing a liberal quantity of good nutritious food—green food is preferable to any other kind; plenty of pure water, and moderate exercise daily for some time after recovery has taken place; and the work should be light and slow for a month or two.†

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* Opinions vary very much as to the advisability of placing the patient in slings.

Preventive Treatment.—An antitoxic serum (tetanin) has now been discovered, a few drops of which, if injected under the skin of a patient before a surgical operation, or immediately after the infliction of a wound, is a most reliable safeguard against tetanus. It should always be used in districts where tetanus is prevalent. Its value subcutaneously is solely preventive, not curative; and it is of no use when once the disease has gained a foothold.

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* The bacillus is 'anaerobic,' and only manufactures its toxin under those conditions. The chief troubles lie in the difficulty of gaining access to it, and also in the fact that sufficient toxin has usually been manufactured to poison the system before ever the presence of the organism is suspected.

† Two cases of cure after intracranial injection of tetanin have recently been recorded by Villar (*Journal of Comparative Pathology and Therapeutics*, December, 1901).

HYSTERIA

This is a disease of the nervous system, and is characterized by a highly nervous and excitable condition. It is usually seen in mares and bitches, but has also been noticed in animals of the opposite sex in certain rare instances. A change of some kind taking place in connection with the generative system is supposed to be the cause of hysteria.

Symptoms.—The animal becomes excited to a very great degree. The pulse becomes rapid and very difficult to take. One peculiar symptom is continual neighing, and in some cases there is a sort of hiccough, caused by spasm. After the animal has suffered awhile, the body becomes covered by a profuse perspiration. There is in some cases a whitish or reddish coloured discharge from the vulva. Hysteria usually occurs about the time of the animal coming into heat, but has been noticed in pregnant mares. The above symptoms will often persist for one or two days and disappear without anything having been done. Sometimes the appetite is impaired; the animal often urinates, etc.

Treatment.—Keep quiet; give a purgative, opium, belladonna, potass bromide, etc. In nymphomaniac mares perform ovariotomy.

Cerebral Tumours.—These tumours are often met with in what is known as the choroid plexus. They grow very slowly, and are often of a fibrous character. In some cases they are cystic tumours, and often contain a substance called brain-sand (a white shining substance of a scaly nature), or such tumours may consist of a tuberculous deposit. They rarely give any indication of their presence until they have attained a certain size, when various symptoms of their presence are manifested, as vertigo, an irregular gait, convulsions, apoplectic seizures, general inability to perform work, etc. Inflammation of the brain may also result from the presence of such tumours. As nothing can be done, it is useless to attempt any treatment.

Tubercular Meningitis.—This disease occurs in animals of a tuberculous diathesis; is sometimes met with in the horse, but oftener in highly-bred cattle. The symptoms are those of cerebral disturbance as ordinarily manifested.

Thickening of the Dura Mater.—This condition is of rare occurrence, but occasionally is met with both in the horse and the ox, causing partial absorption of the cranial bones, and even of the brain substance; the hard structures we find, as a rule, yielding to the soft structures. The symptoms are those of brain disease. No treatment is of any avail.

Atrophy of the Brain.—This condition is rare, and, like hypertrophy, when it does occur, it is usually as a sequel to some one or other of the many diseases affecting the brain.

Hypertrophy of the Brain.—This disease usually occurs in connection with the meninges of the brain, although the brain itself occasionally becomes enlarged.

Tumours.—The most common brain-tumour is the psammoma, found in one or both of the lateral ventricles. It is usually egg-shaped, sometimes as large as a duck's egg, and gritty or calcareous in consistency.

Symptoms.—Dulness on the part of the patient. He is subject also to sudden attacks of convulsive fits, and in many cases the patient, when left to himself, shows an inclination to seek the most elevated spot accessible. If the tumour exists in connection with the medulla, the animal will often, without warning, drop to his knees as suddenly as though struck by lightning. This condition, and the similar ones previously described, give rise to about the same general symptoms, and, like atrophy and hypertrophy of the brain, this condition is incurable.

Softening of the Brain.—This is a very rare condition in the horse, but it does occasionally occur, and when it does it is usually as a result of epizootic cellulitis. The disease may occur as a result of many other causes with which we are unacquainted. The symptoms are drowsiness, hanging of the head, dulness, snoring respiration. The pulse is slower than normal. On being made to walk out, the animal shows a tendency to stagger, trip, and sometimes fall.

Treatment.—Not very much can be done to relieve the condition, except perhaps to administer an occasional purgative. Work lightly, and pay proper attention to feeding, etc., endeavouring to preserve the general health. It is a progressive disease, and sooner or later causes death.

CHOREA

Definition.—A disease of the nervous system, characterized by involuntary and convulsive muscular movements. It is a somewhat frequent disease in dogs and horses. It occurs in several forms, the most common of which, in the horse, is known as 'stringhalt,' affecting the flexor and extensor muscles of the hind-legs. In the dog, usually the muscles of the head and neck are affected, or perhaps the voluntary muscles of the whole body. In the horse, the muscles of a hind-leg, or a fore-leg, and sometimes the muscles of the whole body, are affected. In such a case it is known as 'shivers.' In the human being the same condition has received the name of St. Vitus' dance.

Stringhalt.—May be defined as a violent spasmodic jerking, or irregular movement of one or both hind-legs, due probably to certain changes in the nerve-supply.

It is caused by some lesion or abnormal condition of the nervous system. Some contend that it is a disease of the spinal cord, and others say that the trouble is due to some affection of the brain. Again, it is said to be due to irregular distribution of nervous [illegible] to the extensors and flexors of the limb. This [illegible] probably the correct opinion; but, at the same time, [illegible] explained why the nervous influence is so irregular [illegible]ted. But it can readily be understood that the [illegible] any foreign substance, as a melanotic tumour, [illegible] upon the nerve, or in any way interf[illegible]e, would be sufficient to cause it to perform its [illegible] an improper manner. Some think it is due [illegible]ation of the nerve centres, while others consider [illegible] caused by irregular nervous influence due to reflex action, emanating from a diseased hock or joint. Want of power due to paralysis of the opposing muscles, cramp of the flexor metatarsi, rheumatic affection of the muscles, shortening of the flexors of the hock, and a thousand other so-called explanations have been given. The latest is the theory of Ginther, who considers that it is due to a shrinking of the fascia of the limb, and, as a proof, he claims to have cured the disease by cutting through the fascia. This theory, however, is scarcely tenable. It is a difficult disease to understand.

Symptoms.—The disease is influenced and aggravated by cold. Some cases have come under observation that were very badly affected during the winter, while in summer the condition was scarcely noticeable. The peculiar action of the hind limbs is better seen when the animal moves forward. The limb is jerked, and it is plain to anyone that the action is a wholly involuntary one. In some cases the animal may move quite a distance before jerking the leg up. Again, some animals must be turned first to one side, then the other, backed, and led forward—in fact, put through every conceivable movement—before the tell-tale jerking of the limb can be discerned. The practitioner cannot be too careful or energetic in his endeavours to discover this defect when examining a horse as to soundness. In some cases it is better noticed when the animal trots than at any other time. In examining the animal, walk him quietly along, then trot him; after which, turn him first one way and then the other, back him forcibly, and bring him forward suddenly, taking care to excite him somewhat. The disease is so severe sometimes as to cause the leg to reach the belly in its spasmodic movements. In such cases, the foot continually striking the belly causes the hair to become worn off the part. The disease may follow exposure to cold, or irritation of the periphery of the nerve, as in cauterizing or blistering for ringbone. The ringbone disappears, but the nerve is irritated and stringhalt is the result. Some horses do not show it outside in the least, either in walking, trotting, backing, turning, etc., but show it in the stable, when moving from side to side. Stringhalt constitutes an unsoundness. A case of well-marked stringhalt may be met with in March; in May, when the hot season arrives, it will appear to be nearly or quite well. If it is only a slight case, it does not affect the usefulness of the animal. Sometimes a case of stringhalt is developed within a very short time.

Treatment.—In most cases it is incurable, but may be palliated by giving a cathartic or by nerve sedatives. Peroneal tenotomy* and posterior tibial neurectomy have each given successful results.

Shivering.—Shivering is another form of chorea, due, in all probability, to some lesion of the spinal cord. It affects the posterior parts, more particularly the muscles of the gluteal and femoral regions. It varies in intensity to a considerable extent, and is most frequently seen in heavy horses.

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* *Journal of Comparative Pathology and Therapeutics*, vol. x., p. 179, and vol. xiii., p. 259 (Robb); *ibid.*, vol. xiii, p. 86 (Hobday).

Symptoms.—Shivering is best noticed when the horse is backing, or endeavouring to back, as in many cases it is utterly impossible for the animal to back at all. It is more noticeable if the patient be harnessed to a vehicle, when, on trying to move backwards, it is discovered that he cannot do so; or, if he does, it is only with the greatest difficulty, and the exertion causes him to become very excited. He acts as though stubborn, a peculiar twitching of the muscles is observable, and the tail is slightly elevated and quivering. The more force that is brought to bear to cause the animal to back, the more aggravated the symptoms become, and many a poor horse has been cruelly whipped for not backing, when it was utterly impossible for him to do so.

Treatment, as a rule, is useless. Nerve tonics, sedatives, stimulants, etc., may be tried. It is a very bad form of unsoundness.

Chorea in the dog usually occurs as a sequel to distemper. The convulsive twitchings may only affect one limb or set of muscles, and are usually more noticeable when the patient is asleep or tranquil. The head and neck may be constantly nodding or the masseter muscles alone seem to be throbbing. When the whole body is affected the poor animal gets very exhausted and emaciated.

Treatment.—Prognosis must be very guarded as recovery is rather the exception than the rule. If, however, the symptoms have only just commenced, it is always worth while to attempt treatment. Give potassium or strontium bromide for a week or ten days, and follow up by nerve tonics, such as Strychnine (very conveniently dispensed as

Easton's Syrup), Liq. Arsenicalis, or Quinine. Potassium iodide is sometimes useful. Persist carefully and *regularly* for at least three months before giving up. Galvanism may be tried. Generous diet is essential. Exercise carefully without making the patient tired. Attend to the condition of the bowels.

MYELITIS

Definition.—Inflammation of the substance of the spinal cord. If the coverings of the cord are also inflamed, it is known as spinal meningitis. It occurs both in the acute and sub-acute forms, and there may either be effusion or softening; the spinal cord loses its power, and paralysis ensues. Anything affecting the brain may also affect the cord; as, for instance, injuries received in running away, or in various ways—rolling into a hole in the pasture and struggling violently, or struggling when confined for operations. Certain grasses and bad food also cause the disease. Severe exertion, nervous excitement, etc., also operate as causes. At times it might be classed almost as an enzöotic disease. It sometimes occurs also in connection with azoturea. It is very likely to terminate in paralysis, which may be due to softening of the spinal marrow. It is more common in stallions, resulting from slight inflammation of the cord and its coverings, followed by softening and paralysis; stallions, as before stated, being more subject to nervous diseases than are mares or geldings.

Symptoms.—The symptoms of the acute form are as follows. The animal shows very great nervous irritation, in some instances perspiring to such an extent that it would almost lead one to think it was a bowel trouble. He may fall, and be in many cases unable to rise without assistance. When assisted to his feet, he looks at his sides—again suggesting a bowel trouble. When lying down he will struggle violently to get up, and when up he makes the most frantic efforts to retain the standing position; in fact, sometimes a bone is fractured in the attempt to remain standing. Pyrexia is usually marked. Pulse wiry and high, temperature elevated, etc. After a while the limbs can be pulled about or placed in any position without the slightest resistance being offered. One of the vertebræ may be fractured, and pressing upon the cord. The case may prove fatal in twenty-four or forty-eight hours from the first appearance of the attack.

Symptoms of the subacute form are, a quickened and somewhat irregular pulse; the patient is very easily excited; there is partial loss of motor-power; convulsive twitchings, in some cases, of the shoulders or hind-quarters are noticed. Perhaps he is able to rise only with the greatest difficulty, and walks with a dragging motion. In some cases the urine is retained within the bladder and voided in a natural manner; in other cases it is not voided as it should be, but dribbles away when the bladder becomes full to overflowing. The disease, according to my experience, occurs more frequently in winter than at any other time.

Treatment.—If due to an injury, and complete loss of motor-power is present, and the practitioner has reason to believe that the back is broken, or that the integrity of the spinal cord has been interfered with, destruction of the animal should be advised. In other cases, where reasonable hopes of a recovery may be entertained, the case may be treated. When congestion is present, as in the early stages, nerve stimulants are contra-indicated, and their administration will do harm. Ergot of rye may be administered at proper intervals, and in the usual sized doses, and may be given in conjunction with potassium nitrate or iodide. Local applications, as counter-irritants, are to be applied over the course of the spine, a newly-flayed sheep's skin being excellent for the purpose; cloths wrung out of hot water are also of great benefit. Various remedies may be used, as belladonna, bromide of potassium, etc. Aconite is also recommended. In cases where pain is excessive, an opiate should be given. After the congestive or inflammatory stage has passed off, a certain amount of effusion takes place, which is usually followed by softening of the cord. At this stage the administration of nerve stimulants is indicated—nux vomica, or strychnine may be used. The after-treatment consists of good and nutritious food, pure water, gentle exercise when able to bear it, frequent grooming, and no attention which can be bestowed upon the animal should be withheld. Potassium iodide is useful to hasten removal of effusion when present after the acute symptoms have subsided. If complete paralysis ensues the prognosis is unfavourable.

PARALYSIS

Definition.—Loss of voluntary motion, either with or without loss of sensation. It usually comes on suddenly, hence has been described as a 'stroke,' but occasionally it comes on slowly. It may be divided into two classes, 'perfect' and 'imperfect,' the first-named causing death very quickly. It may again be described as 'general,' and 'partial,' or what perhaps would be better, as 'complete,' and 'partial.' It is further subdivided into '**hemiplegia**,' paralysis of one side of the body, more common in man than in animals, and '**paraplegia**,' paralysis of the posterior half of the body. This is the form usually seen in our patients. Again it is described as 'local' in cases where paralysis of a muscle, or two or three muscles occurs; a very good example being paralysis of the muscles of the lips. Reflex paralysis is where paralysis is caused by irritation existing at the peripheral portions of the nerves, a very good example being the paralysis due to gastric irritation, which sometimes follows gastritis. Pressure on the spinal cord causes paralysis of all the parts posterior to the injury.

Hemiplegia.—This form of paralysis is not of common occurrence amongst the lower animals, and results from some disease of the brain, as sunstroke, or concussion caused by a blow, fall, etc. It is often associated with cerebral tumours.

Symptoms.—When down the animal cannot rise, motor power, and sometimes sensation of one-half of the body being lost. The coat becomes staring, dry and dusty; debility becomes more and more marked, and finally death takes place. Sometimes a cure is effected, but it is very rarely indeed.

Treatment.—If the animal can support any portion of his own weight when up, it is advisable to place him in slings. Clothe the body according to the season. The patient is to be carefully dieted, and may receive a purgative, to be followed by nerve stimulants, as nux vomica, or its alkaloid strychnia. A moderately strong embrocation may be used a couple of times daily; hand-rubbing may also be of benefit, but it is as a rule wasted time to treat the affection.

Paraplegia.—This form of paralysis frequently comes under the notice of the veterinarian. It is caused in a great variety of ways, as by slipping, falling, jumping with a heavy weight on the back, by being cast and secured for an operation, or anything that will cause fracture of the dorsal or lumbar vertebræ, and sometimes by fracture and displacement of any of the bones of the vertebral column by violent muscular contraction on the part of an animal when secured for the purpose of having an operation performed. More particularly does this take place where the animal is old, and ankylosis of the vertebræ is to be suspected in horses with spavins, ring-bones, etc. In such a case the operator should warn the owner of the risk. Paraplegia may also be caused by gastric irritation, softening of the spinal cord, by the presence of tumours pressing upon it, and also may be caused by the presence of tumours or deposits of a tuberculous character. The portion of the spinal column most liable to injury is that formed by the lumbar and posterior portion of the dorsal vertebræ. Where complete loss of motion is present, there may for a short time afterwards be sensibility, and some slight motor power of the tail may remain, but this gradually disappears. If the paralysis be due to fracture of the anterior dorsal vertebræ, there will be loss of motion in the anterior as well as in the posterior extremities. When the posterior extremities only are paralyzed, the practitioner may know that the injury is situated pretty well back. If injury to the spinal cord occurs anterior to where the phrenic nerve is given off, death occurs instantaneously. Partial loss of power is oftenest seen in stallions, the symptoms being a slightly staggering gait, and a sort of plucking up of the legs when backed. This form of paralysis may be treated with success by nerve sedatives, proper diet, etc.; changing after a while to nerve stimulants. Support the animal in slings, unless he throws his whole weight in the slings, in which case do not sling, as the lungs and bowels cannot act. The same treatment is applicable as to hemiplegia where it is curable.

Paralysis of the Lips.—This form of paralysis is by no means rare in the horse, and is usually referable to some injury to the brain or to the nerve supplying the lips. On the American continent it is due to cold oftener than anything else. Irritation of the nerve by an ill-fitting halter will also produce it.

Symptoms.—Hanging of the lip, which may also be slightly drawn to one side. The animal has great difficulty in prehension, and in some cases mastication seems difficult. On taking a drink, the animal thrusts his muzzle deeply into the pail.

Treatment.—If due to a badly-fitting halter, remove the cause, bathe the lip with warm water, dry thoroughly, and rub with a stimulating liniment. Give a laxative and soft food. In certain cases stimulate the parts with a mild blister. If due to brain trouble, the cure will be difficult, and the animal will exhibit the usual symptoms of brain affection.

Paralysis of the Coccygeal Muscles.—Symptoms are those of paralysis, easily recognised, accompanied by atrophy of muscle and inability to raise the tail to pass fæces. Slightly elevate the tail with a crupper, give nerve-stimulants internally, and apply stimulants externally. Prognosis is very unfavourable.

CEREBRO-SPINAL MENINGITIS

Definition.—Inflammation of the spinal cord, brain, and coverings. 'I question very much whether there is any very active inflammation in the parts, and consider that the symptoms may be produced by congestion of the blood in the vessels of the part, causing pressure upon the brain and spinal cord, and producing the disease. A good name for it would be cerebro-spinal fever. It is comparatively a new disease, and it may almost be said to be confined to the American continent, as we hear very little about its occurrence in any of the old countries. The affected part is the cerebro-spinal axis, or system, but I am inclined to think that the great sympathetic system is also involved. Irritation may be caused by poisonous substances being taken into the system in quantities sufficient or of a kind to produce this disease. It is a far more common disease of man during the last twenty years than ever before' (Smith). In horses it is more common in the United States, and it is of greater frequency amongst horses standing in badly-ventilated stables, as underground stables, etc., the reason in all probability being that such horses are necessarily debilitated to a greater or less extent, and are consequently more susceptible to the influence of the poison, whatever that may be.* Imperfect drainage, bad ventilation, the crowding together of large numbers, poor food, etc., undoubtedly debilitate and render both animals and men more susceptible to disease. The disease has occurred in comparatively a mild form, and has affected few animals, except in large cities. During the year 1872 it made great havoc in New York, Boston, and Philadelphia, the street-car horses suffering more than others. The disease occurs in an enzoötic and in a sporadic form, the latter form being the one chiefly met with in Canada.

Causes.—Cerebro-spinal meningitis is said to be produced by atmospheric influences, bad ventilation, etc. Among the exciting causes may be mentioned food and water containing vegetable or animal matter in a decaying or putrid state, which has a toxic effect upon the system, and produces the disease. Professor Smith says: 'In nearly every case I have had, I have been able to trace it to water loaded with vegetable or animal matters in a state of decomposition. Some nine or ten years ago, I recollect a certain establishment was visited by a mysterious disease, quickly causing the death of nine or ten horses. All the healthy animals were removed from the town under the impression that it was some very fatal and contagious disease. I was sent by the Government to investigate the outbreak, and found the symptoms of cerebro-spinal meningitis well marked. The bowels were constipated, urine scanty, etc. The post-mortem showed no very well-marked symptoms. They were drinking water from a well, situated close to the stable, and into which some of the stable drainage ran during rains. I warned the owner not to use the water for his horses. He did not use it again until the following year, when he came to the conclusion that a well he had used water out of for so long could not possibly be of harm to his horses, and, notwithstanding my advice to the contrary, he again used it, and very shortly had all his horses affected with cerebro-spinal meningitis. They were also being fed on roots in a state of decomposition.'

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* Recent observations seem to point to a micro-organism as the actual cause.

Symptoms.—The symptoms of this disease vary considerably, and are governed by the part or parts most severely affected. There is loss of power, which may be suddenly or gradually developed. Anorexia is either partial or complete. In some cases at an early stage the temperature increases. After a time it decreases; then, as the disease progresses, it again increases. Spasm and twitching of the muscles may be observed, sometimes of the posterior extremities; and in other cases the muscles of the head and neck are affected, and symptoms of trismus are sometimes presented. The disease sometimes appears in an epizoötic form. In very severe cases the animal reels about, falls, and is unable to rise, although he makes the most frantic endeavours to do so. The bowels are constipated, the urine is scanty, and there is an abnormally reddened condition of the iris, which may be detected by using the ophthalmoscope. In some cases well-marked cerebral disturbance is manifested, the animal is dull and drowsy, and becomes comatose; this gives place to slight delirium, convulsions, and death.

Having had very little experience with this disease, I feel that I cannot do better than to again quote the observations of Professor Smith, who probably has had as great or greater experience with this disease than any other veterinarian. Professor Smith says: 'I have noticed as a symptom of the sporadic form of cerebro-spinal meningitis that the power of deglutition is lost. This symptom is never met with in the enzoötic form of the disease. In Canada it generally occurs in a sporadic form, and the nerve centres are affected; the pneumogastric nerve is interfered with in its functions, and the power of deglutition is lost. This is one of the principal and most prominent symptoms exhibited. We often hear of a number of horses becoming affected with some disease which runs a quick course and terminates in death. On making a post-mortem examination the disease is usually found to be cerebro-spinal meningitis. The symptoms of the sporadic form are as follows: Dulness of the animal is usually the first observable symptom. The bowels are constipated, and the patient exhibits great thirst, and on being given water will apparently drink heartily; but on close observation being made it is seen that he is unable to swallow, although making every effort to do so. Where loss of the power of deglutition is well marked the prognosis should be unfavourable. On opening the mouth and making an examination it is found to be cool, and in a perfectly normal condition so far as can be ascertained, and on account of the inability to swallow, the practitioner may be led to believe that some obstruction is present, and passage of the probang may be tried, which, on account of loss of power of the parts, may prove to be a matter of some difficulty. The ears are colder than natural, and the temperature is lower than normal, unless it be towards the latter stages of the disease, when it may be elevated; the pulse is slow and weak. These symptoms may last for twenty-four or forty-eight hours. In other cases symptoms of abdominal pain are manifested, the patient falls or lies down, and remains down for ten or fifteen hours, and will not rise unless whipped severely, or considerable force otherwise is brought to bear. In other cases the standing posture will be persistently maintained, and as a rule the disease will run its course to a fatal termination in from two to four days. Strabismus, or squint, is also often present in the eye as a symptom of cerebro-spinal meningitis.

Post-mortem.—The brain and spinal cord are found to be congested, and in some cases considerable effusion is found to have taken place. There is exudation in connection with the intestines, and if the animal has been lying down for a long time there will be hypostatic congestion of the side he has been lying upon. In most cases the congestion of the brain and cord is well marked, and as a rule the bowels are found nearly or quite empty. It is possible for death to occur, however, without any well-marked post-mortem lesions being presented.

Treatment.—Where there is complete loss of power it is invariably fatal. If you get the case early, place the patient in a roomy, loose-box. Use belladonna, or give atropine gr. ss. once or twice daily. Bromide of potassium is useful. Apply heat and cold alternately to the spine; hand-rub and warm the extremities with hot water, anodyne liniments, etc. Give stimulants, using a catheter or probang for the purpose, where power of deglutition is lost. Nourishment may be given in the same way. Change food and water of healthy as well as sick animals. Treatment is unsatisfactory as a rule, the animal generally dying.

Hydrocephalus (or water in the cranial cavity).—This condition is often met with, both in human and veterinary practice. As a rule the lower animals do not survive very long when suffering from hydrocephalus. The contrary may be said as regards the human, as they will live even to middle life, and have a pretty active brain. Sometimes the head of a fœtus, on account of this disease, attains such a size, that it is a matter of impossibility for delivery to take place. In such a case delivery is effected, or at least made possible, by making an opening into the cranial cavity of the fœtus, and allowing the fluid contained therein to escape.

STURDY, OR GID

This disease affects sheep oftener than any other animal, although no animal is exempt from an attack. It is also called 'turn-sick,' and is called 'gid' in reference to the vertigo, which occurs as a symptom. The disease is due to the presence in the brain of a parasite called the 'cœnurus cerebralis,' which is developed from the tape-worm of the dog; and this hydatid, if given to the dog, will produce a tape-worm, which, becoming fully developed, leaves the dog in segments, each ripe segment containing a large number of eggs: the egg is picked up by the sheep whilst grazing or drinking; on reaching the stomach its shell is readily dissolved, setting free a minute parasite, which enters the circulation, by which it is carried along until finally it reaches the brain, where it becomes encysted, and sets up a considerable amount of irritation. It is most likely to exist where sheep and dogs mix. Any part of the brain may be attacked, but the hydatid usually locates itself in the upper part of one hemisphere, or between the hemispheres. The pin-like points on the hydatid penetrate the covering of the brain, causing effusion, and sometimes absorption of the bones.

Symptoms.—The affected animal leaves the flock, walks in a circular manner with the head carried on one side, when the hydatid is located in one hemisphere; when it is situated between the hemispheres, the head is carried in an elevated position, and the animal has vertigo. There is softening, elevation, and partial absorption of the bones.

Treatment.—Make an opening with a knife, or trephine, and draw out the fluid and the hydatid at the same time with a syringe. Prognosis must be very guarded, as usually the cyst has made such a hole in the brain that recovery is impossible.

RABIES

Definition.—A disease of the nervous system characterized by fever, a high degree of irritability and excitement, the presence of a spasm, a disposition to bite, great prostration, and finally death. It was called hydrophobia on account of inability on the part of the sufferer to drink water, which inability was supposed to be caused by dread of the liquid. However, as the rabid animal has not the slightest dread of water, and is only prevented from taking it by spasmodic action of the muscles of deglutition, it will be seen that the term 'hydrophobia' is a misnomer, a far better name being rabies (from 'rabio,' to rave).

Man and all of the lower animals are liable to this disease, which is of rather frequent occurrence, and quite recently has been remarkably prevalent in England* and some of the United States of America. It occurs oftener amongst dogs than other animals. It is very rarely noticed

* This was written in 1887. Now, in 1901, thanks to the energetic action of the late President of the Board of Agriculture (Mr. Walter Long, M.P.), under the advice of his Veterinary Department, rabies is practically extinct, and so long as the quarantine regulations are properly enforced, there is reasonable prospect for hoping that this dreaded disease will not make its reappearance, at all events to stay.

in Australia and New Zealand, and has, until recently, been comparatively rare in Canada and the United States. It is, however, very common in Peru, Chili, and some other countries. Rabies belongs to the class of zymotic diseases, and is communicable by inoculation to all warm-blooded animals. It is stated by some writers to be spontaneously generated, but I believe it to be due in every case to contagion. Climate does not appear to exert any amount of influence over its production. It is very generally imagined by people that dogs are more liable to have the disease during very hot weather; hence it is that laws have been passed nearly everywhere requiring dogs to be muzzled during the hot season. It is barely possible that the disease may be invited or developed by the irritation caused by the muzzle, and want of a proper supply of water. However, experience proves that hot weather does not exercise the slightest influence, so far as being the actual cause or producing the disease is concerned. The contagious principle or virus* exists only in the fixed form, and never in the volatile form, so far as is known. The virus exists in every tissue of the body, but in the brain, spinal cord, and saliva it is found in its most potent forms. The potency of the virus is, however, soon lost after death occurs. It is claimed that the virus becomes weaker after passing through several bodies. The first bites of a rabid dog are said to be the most dangerous. The period of incubation varies from ten days to six or seven months,† and in man cases have been observed wherein the period of incubation varied from five days to ten months, and a few cases are recorded wherein several years elapsed after the bite was received before the disease manifested itself. However incredible this may seem, it is nevertheless true. Rabies, as it ordinarily occurs, is produced by a bite from a rabid animal, the virus being left in the wound at the time the bite is inflicted. It may also be produced by an affected animal—or one that has been exposed—licking a wound, etc. It may be communicated in other ways, as in the case of a man who, while skinning a dog that died of the disease, thoughtlessly placed the knife in his mouth, as a result of which simple action rabies became developed within the usual period. The symptoms presented tend to show that the disease depends upon some peculiar change in, or action upon, the nervous system. It is a disease that very quickly spreads ; and every practitioner, to insure his own safety, should thoroughly understand the malady, and be able to recognise it at a glance. It is nothing unusual to see a dog hounded about the streets, and said to be mad, when he is not rabid, but is only excited or frightened.

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* The specific cause of rabies has not yet been clearly demonstrated, although there is every reason for thinking that a micro-organism will be found to be the origin.

† A case occurred in the Royal Veterinary College, London, in which a retriever dog, sent to Professor McFadyean by Mr. Hoole, M.R.C.V.S., of Sleaford, and supposed to have been bitten by a rabid animal, was kept under close observation for between six and seven

Symptoms.—Rabies, as affecting the dog, occurs in two forms : a furious, and a dull morose form, the latter being known as dumb rabies. Like other brain affections, this disease is preceded by dulness : it is noticed that the animal is not so lively as usual, but is slightly dull and somewhat sullen ; this period of dulness is followed after a time by temporary fits of excitement, after which the patient may relapse into the previous condition of dulness. The animal also shows a tendency to seek out-of-the-way

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months before symptoms of rabies appeared. In fact, had the symptoms been delayed a few days longer, the dog would have been returned to his owner as healthy.

places, where he will lie very quietly for some time, when suddenly he will become greatly excited without any apparent cause. Another prominent symptom is a depraved appetite, the animal eating dirt, fæces, etc.; he becomes savage, and will bite or snap at any object, animate or inanimate, that comes in his way, or that moves in his immediate vicinity; and a dog that in health has been noted for his docility will, when suffering from this disease, become very irritable and prone to bite. A rabid dog, however, will not go far out of his way to inflict a bite; neither does he inflict several bites in succession, but snaps at any object that may happen to be in his way, and passes on. One peculiarity of the disease is that the affected animal shows a great antipathy to animals of his own species. He travels with a peculiar long swinging trot, the tail hanging down, and often with the tongue hanging out of the mouth. Generally an excessive secretion of saliva takes place and flows from the mouth, and the head is carried lower than usual, except at the moment of excitement. Deglutition, which at first is not very difficult, gradually becomes more and more so, as the disease progresses, until finally any effort to swallow results in a severe convulsive fit, or spasm of the muscles of deglutition. The periods of excitement are followed by corresponding periods of depression; the former as the disease advances becoming less marked and of shorter duration, while each of the latter occurs in a form better marked, and is of longer duration than the one preceding it. Finally, paralysis partial or complete occurs, and is quickly followed by death.

Treatment.—After the disease has become manifest its invariable termination is death, hence the affected animal, instead of being treated, should be destroyed at once.* In the case of a valuable animal or a member of the human family being bitten by a rabid animal, the wound should as soon as possible be thoroughly cleansed and freely cauterized; caustic in a liquid form being preferable, as if used in a solid form some portion of the wound is likely to escape the action of the caustic. In addition to which, as a precautionary measure, inoculation as practised by M. Pasteur (the French scientist) should be performed. It being claimed that inoculation (after infliction of the bite) the occurrence of the disease may be prevented, an assertion that is disputed by many; however, it is not my intention to here discuss the efficacy or non-efficacy of M. Pasteur's method of prophylaxis; suffice it to say, that the experiments up to the present time have been eminently satisfactory, and that the sanguine expectations entertained in regard to the beneficial results of inoculation will in all probability be fully realized.*

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* If the animal has bitten anyone and can be got into a perfectly secure place where there is no risk of contact with other animals

Rabies, as affecting the horse, is caused by the bite of a rabid animal, or in some way coming into contact with the rabic virus, which, having gained entrance into the system, sooner or later exerts its peculiar effects and causes death. The disease manifests itself in a great variety of ways, it being very rarely indeed, if ever, that two cases are met

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or man, it is wise to keep it under competent veterinary observation for some time, in order that the truth may be arrived at. In any case, where a person has been bitten and there is the slightest reason for suspecting rabies, the patient should be advised to proceed without delay to the nearest Pasteur institute for treatment.

* This was written in 1887, and now, in 1901, the most sanguine expectations have indeed been realized. France, Russia, India, and other countries have built 'Pasteur' institutes, where patients, having been bitten by rabid, or supposed rabid, animals, can be treated at a minimum of expense, although, owing to the mistaken opposition of certain people in England, this country is still lagging behind, and Britishers have to journey to Paris for treatment.

with in which the symptoms presented are identical. As a rule, however, an animal suffering from rabies shows a disposition to bite, and viciousness generally is manifested, the animal endeavouring to destroy everything within its reach. The symptoms of general derangement of the nervous system are exceedingly well marked; the animal never rests for a moment, but paws and stamps violently, occasionally sweats profusely, and, the excitement increasing, a perfect paroxysm of fury is at last reached, when it is a matter of extreme danger to approach the animal, as he will attack with the greatest ferocity any person or thing that may be in his vicinity. A paroxysm is usually succeeded by an interval of quietude, or probably of exhaustion; the slightest noise, however, usually sufficing to bring on another paroxysm. There may be a hoarse cough, which, on being heard, will at once command attention on account of its peculiar sound; there may also be observed quickened breathing, and while thirst is manifested, the patient is unable to swallow, or does so with great difficulty, owing to spasm of the glottis. Rapidly recurring and prolonged convulsive fits quickly produce exhaustion, and death invariably occurs in the midst of frightful convulsions, in the course of three or four days after manifestation of the first acute symptoms of the disease, treatment being of no avail whatever.

CHAPTER VIII

Inflammation

INFLAMMATION is manifested by heat, pain, redness, and swelling. The heat is due to the amount of blood that is sent to the part, as well as to certain changes which are taking place in the blood itself. The heat is more apparent to the sufferer than to the observer; it is more sensibly increased, and becomes more apparent to the examiner, when the inflammation is remote from the centre of circulation. Pain is a characteristic symptom of inflammation, a good example being in laminitis, in which the pain is excruciating. In pneumonia, the horse very often appears to be suffering pain only in a very slight degree, if at all, even in cases where the inflammation is sufficiently severe to cause death.

Redness depends upon the quantity of blood sent to the parts; sometimes it is a dark red with streaks in it, at other times a bright red or florid colour is observed, in which case the inflammation is of the most acute type. Swelling is usually a prominent, but not an invariable sign of inflammation. It is due to an engorged state of the blood-vessels of the parts affected, or to exudation. As a rule swelling is to be regarded as a favourable symptom when occurring in inflammation, as it affords relief, allaying pain, etc., except when occurring in connection with the sensitive laminæ and similar parts. Inflammation is subdivided into chronic, acute, subacute, local, diffused, and specific, this latter form being caused by the presence of some poison in the circulation. A full, bounding pulse generally accompanies inflammation of a 'sthenic' type; the asthenic type is generally seen in lung diseases of an epizoötic and depressing character, and pulse usually weak. The results of inflammation are resolution, adhesion, effusion, suppuration, ulceration, and mortification, or gangrene. In 'resolution' the part is restored to its natural condition, some soothing application is applied, and the inflammation is allayed very quickly. The exudation may solidify, in which case applications are to be made to break down the structure. 'Adhesive inflammation' is where there is inflammatory action, and the exciting causes, as exercise, etc., are kept up until a permanent thickening of the affected part results. 'Effusion' is where an exudation of serum takes place, as in inflammation of the pleuræ, etc. In circumscribed suppuration an enlargement makes its appearance, which on palpation is found to be hot, hard, and painful. It goes on gradually increasing until a full state of development is reached; it comes to a point and finally bursts. As a rule we apply heat to the part to favour the development of pus, and hasten suppuration; hence we make use of stimulating applications, as liniments, vesicants, etc. It occurs usually in cases where the inflammation has been long continued, and the circulation of blood in the parts obstructed, and molecular death of the part occurs. 'Gangrene' occurs as a result of inflammation, and is death of the tissues either of a portion or whole of an organ. Gangrene may take place without inflammation having occurred, as it may be the result of an operation, or of anything interfering with the circulation of the blood. Gangrene affects the whole system, and sets up such a constitutional disturbance that death often follows as a result. In cases where recovery takes place, the gangrenous portions are removed by sloughing. In gangrene of the bowels death invariably results. It is wonderful how the lungs will recover when a part of them have been gangrenous, in which case the gangrenous portions are expelled in the same manner as any other foreign substance.

Treatment of Inflammation.—The first thing to do in the treatment of inflammation is to ascertain, if possible, what is the exciting cause. Having done this, it should be removed. The inflamed parts should be kept in a perfect state of rest. General quietude and dieting of the patient are also very important adjuncts in the treatment of inflammation. Medicinal remedies may be both local and constitutional. At one time blood-letting was practised indiscriminately, and considered to be the only means by which inflammation could be successfully combated. However, that idea is long since exploded, and other and more rational means of treatment are now adopted. Bloodletting is no doubt of some benefit in certain and judiciously selected cases of inflammation; but in a vast majority of cases the abstraction of blood is not only absurd and useless, but is positively injurious, and indiscriminate bleeding should be neither practised nor tolerated. One of the best reasons ever given for bleeding was the one given by the farrier who, on being asked by a gentleman what he was bleeding a horse for (the horse appearing to be in perfect health), immediately replied, 'For a shilling, sir.' Thousands of animals and human lives have been destroyed by the use of the lancet. Bleeding is, however, useful in certain cases, such as in acute laminitis. Cold water as a local application to allay inflammation is used extensively, is highly beneficial in some cases, and when judiciously applied prevents dilatation of the blood-vessels; when applied with proper bandages prevents exudation, and where an exudate is already thrown out hastens its absorption. Hot water is also of great use where the pain is very severe, and the deep-seated structures are involved—in such a case being preferable to cold applications. Warm applications act in an opposite way to cold, as the warmth promotes swelling and relaxation of the tissues, allaying pain and irritability. Heat can be applied in various ways.

Counter-irritants are, in veterinary practice, of very great benefit indeed in the treatment of inflammation; as, for instance, in inflammation of the foot, where hot and cold applications have failed, a vesicant around the coronet will very often effect a cure. Counter-irritants are most useful in deep-seated or chronic inflammation, as subacute or chronic laminitis, etc. It is, however, very difficult to say how counter-irritants act. Sedatives, as blood-letting and the administration of aconite, are also used, and are of benefit in certain cases. Opium is also good where much pain is present; it is the sheet-anchor in the treatment of enteritis. Purgatives are very useful, except in certain diseases, as purpura and lung affections; they act upon the bowels, increase the action of the absorbents, and cause elimination of effete material. Saline remedies, as nitrate, chlorate, and carbonate of potassium are all of very great value in the treatment of inflammation. Diuretics are considerably used in veterinary practice, there being no certain diaphoretic for the horse. In human medicine diaphoretics are considerably used, as diapohresis is readily produced in man.

CHAPTER IX

Diseases of the Bone

DISEASES of bone are arranged under two heads, 'inflammatory' and 'non-inflammatory,' but the line of demarcation between the two is not very well defined. The process of inflammation takes place in bone just the same as it does in the soft tissues. Inflammation of the substance of the bone is termed 'ostitis.' Superficial ostitis is often associated with periostitis, or inflammation of the periosteum. Ostitis may terminate in resolution, forming bony enlargements. On making a section of a bone, compact and cancellated tissue is found. The first effect of inflammation of bone is to increase the size of the Haversian canals. More particularly is this the case in connection with the compact tissue. The earthy salts are partially removed, and their place is filled by the products of inflammation. The union between the vascular system and the earthy salts is dissolved, and the Haversian canals become irregular in outline, run into each other, etc. Inflammation of bone in a greater or less degree gives rise to exostoses, as spavin, splint, etc. Inflammation may be excited by a great many causes, but the most prolific cause of ostitis is injury, either direct or indirect. There may be a constitutional tendency. In joints the articular cartilage very often becomes absorbed, and osseous material is thrown out, producing ankylosis, which is union of the bones composing the joint, and a stiff or completely immovable joint is the result.

Another disease of bone is caries (death of the bone in small particles). Caries occurs sometimes as a result of poll-evil, fistulous withers, etc. It is a condition which requires energetic and careful treatment. A horse may be lame in the hock, and that too for a considerable length of time, without any external manifestation, as enlargement, etc., of the hock-joint being shown. In such a case the articular surfaces of the bones may be ulcerating.

'Necrosis' is death of a bone. The term 'sequestrum' is given to the condition in which a piece of bone becomes detached or exfoliated during the process of necrosis and remains concealed in the depths of a wound.

CARIES

Definition. — Ulceration, or death of bone in small particles. The vertebræ are oftenest affected, as in poll-evil and fistulous withers. In the extremities, the hock bones, the pastern, and navicular bones are the ones mostly carious. A dried specimen of carious bone presents a dry, worm-eaten appearance, due to molecular decay, and it is as a general thing unassociated with pus. In the hock-joint caries is associated with spavin, and in the navicular bone with navicular disease. Caries is, of course, sometimes accompanied by a discharge of a very offensive odour, due to the presence of sulphuretted hydrogen. On going to the bottom of a sinus, the presence of a carious bone can be at once detected by the sense of touch.

Treatment.—The general treatment of caries is somewhat tedious, but in every case the practitioner is to endeavour to bring about a healthy action, and as a rule, the first step in this direction consists in cutting down upon, and exposing the diseased structures. As, for instance, in a case of fistulous withers, the knife should be freely used to divide the soft tissues until the diseased bone is reached, when it should be scraped with the bone-spoon until all carious portions are removed. Where extensive disease exists, scraping with the bone-spoon will rarely suffice, in which case a portion of the bone must be removed by means of the bone-forceps or bone-saw. Sometimes it is only necessary to stimulate the parts; that is, where there is only a slightly diseased condition of the bone. In such a case it may be sufficient to touch the diseased portions of the bone with hydrochloric acid. The wound must then be kept open and treated antiseptically. If the presence of ulceration in an articulation be suspected, the treatment should, of course, be different. If it exists in the true hock-joint, a cure can never be effected; but if in a gliding articulation, the treatment consists in hastening the process of anchylosis. Therefore give rest, and try counter-irritation, which sets up a new inflammation. The products of the original inflammation become organized, converted into osseous material, and the process of union goes gradually on until anchylosis becomes complete and irritation ceases. The best form of counter-irritation in such a case is that resulting from the application of the actual cautery, after which the application of vesicants, repeated at proper intervals, may be attended with benefit, anchylosis usually becoming complete within a few months.

NECROSIS

Definition.—Death of Bone. Necrosis is of rare occurrence in the lower animals, and when it does occur in the horse, it is due in a large majority of cases to injury, either directly or indirectly received, and is very rarely due to constitutional disturbance. Necrosis is analogous to gangrene in the soft tissues. After the bone dies it assumes a very white appearance, and seems to be harder than natural, and finally, becoming exposed to the air, it exfoliates, separates, and comes away. Necrosis is oftenest seen in connection with the lower jaw, and is due to injury caused by the action of the bit. When a portion of bone dies it must be got rid of in some way; its removal is effected usually by surgical interference, and sometimes by an effort of nature.

Symptoms.—After necrosis takes place material is exuded by which the necrosed bone becomes covered to a certain extent, and a swelling becomes apparent; after a while there is a discharge from the affected part and an abscess is formed, at which time the dead bone is separating from the living, and is enclosed within an exudate.

Treatment.—Enlarge the opening from which the discharge is flowing, and with the fingers or forceps remove the dead portion of bone. Afterwards thoroughly cleanse and treat antiseptically.

Necrosis also occurs in connection with other parts besides the one mentioned, as the point of the ilium sometimes becomes necrosed in consequence of an injury. The symptoms and treatment are the same as above described.

When external exfoliation takes place in one of the cylindrical bones, the process is very tedious, and more so than in any other bone, as when necrosis is going on an exudate is thrown out between the necrosed bone and the adjoining bone, giving rise to an inflammatory process, swelling and suppuration; the covering by the exudate is not complete, but there are small openings through which matter is discharged; it might be said that the bone is dead, and 'buried' in new bone. It affects the constitution to such an extent that generally it pays best to destroy the patient unless valuable. A new bone may be formed which will exhibit nearly the same characteristics as the original bone.

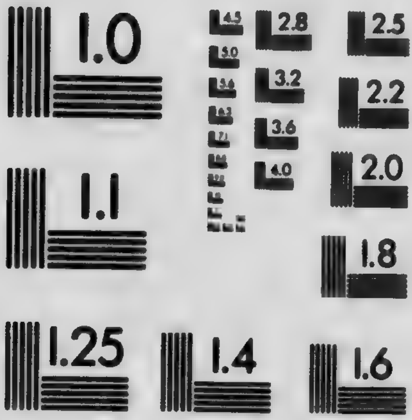
Abscess of Bone.—Abscess of bone is also a result of ostitis, but is of very rare occurrence. In some cases pus may be confined within the bone for an indefinite period; inflammation is first set up in the cancellated tissue of the bone, its exciting cause being usually a blow or kick, and instead of the formation of ossific material, pus is formed, and an abscess results.

Symptoms.—After the formation of pus takes place, a considerable amount of pain is manifested by the animal; there is lameness if in one of the bones of the limbs, where it usually is, and there is usually a circumscribed enlargement of the bone, not nearly so well defined, however, as an ordinary splint. This spot on manipulation is found to be very sore, the animal showing a strong objection to having the parts handled; a bone abscess is, however, as a rule, pretty difficult to diagnose.

Treatment.—Having located the abscess, it is to be opened by trephining, when, if the case has been correctly diagnosed, the imprisoned pus will escape, and relief will be instantaneous. The cavity is kept clean and treated antiseptically.

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



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Joint-ill.—This disease is most commonly met with among calves, foals, and other young animals.

Causes.—Joint-ill is now known to be a contagious disease caused by a micro-organism which gains entrance into the system through the umbilicus before it has healed. It is especially common in some districts, and is very fatal in a large proportion of cases, and in many others the animal, although perhaps not actually dying from the disease, becomes such a wreck as to be of no monetary value.

Symptoms.—The symptoms are usually well marked: when down the animal has considerable difficulty in rising, the articulations become swollen, and on making an examination of the parts they are found to be very painful; soon the joints become very much enlarged, in some cases so large that both hands will not reach around; pus is formed in considerable quantities, and usually the sufferer dies.

Treatment.—In districts where joint-ill is common the greatest care must be paid to cleanliness and disinfection of the surroundings before parturition. The umbilicus of the newly-born animal should be carefully disinfected, and in those which have already developed the disease the greatest care must be paid to their hygienic surroundings. The strength must be kept up as much as possible, the navel disinfected (if not quite closed), and quinine, iron, or other hæmatinic medicine administered. Locally, the joints should be massaged, and the treatment suggested by Wartnaby (*Veterinary Record*, vol. xii., p. 446) is worthy of trial. This consists in injecting about 20 minims of a 4 per cent. solution of formalin subcutaneously over the region of the affected joints, repeating it two or three times at two or three days' interval. A guarded prognosis should be given as even if improvement is shown at first the sequel is not always a satisfactory one.

CHAPTER X

Diseases of the Bone (*continued*)

FRACTURES

Definition.—A fracture consists of a solution of continuity in a hard structure; in surgery it is generally understood to refer to a solution of continuity of bone. Fractures are more or less common among the lower animals, but probably occur with greater frequency amongst horses and dogs. There are several varieties of fracture, as follows:

Simple fracture is that form of fracture in which the bone is broken in a clean manner, and straight or nearly straight across.

Compound fracture is where the broken ends of the bone separate, pierce the soft tissues, injure the skin, etc.

Comminuted fracture is where the bone is broken in several places or shattered.

Compound comminuted fracture is a combination of the two forms of fracture described above; in this form of fracture the bone is shattered and has also entered the soft tissues, lacerating them to a greater or less extent. Besides the above, fractures are described as 'complicated' when important bloodvessels, nerves, or articulations are involved; an 'oblique fracture' is so called on account of the break extending obliquely across the bone; there may also be fracture without displacement, as sometimes happens when the tibia of a horse is fractured, and held in place by the periosteum for days or weeks, without displacement occurring, and in some cases the horse may do light and slow work even, the fractured ends of the bone meanwhile being held in apposition until complete reunion takes place. Fractures occur in various ways, and sometimes very simply, occasionally a very slight slip being sufficient to break a bone. Muscular contraction, as exemplified in the struggles of a horse when cast and secured for the purpose of undergoing an operation, is a not at all uncommon cause of fracture; rearing up and falling backward is a common cause of fracture of the occipital ridge. This fracture is, however, not always confined to the ridge, but may extend to the basilar process, in which case death occurs very quickly. External violence also causes fractures, as kicks, blows, etc. Split pasterns are met with occasionally; such a fracture would be described as 'longitudinal fracture,' if split only in that direction.

Symptoms.—As a rule the general symptoms of fracture are plain, but sometimes excessive swelling occurs, when it becomes a matter of difficulty to state positively whether a fracture has taken place, especially is this the case with bones deeply covered by muscular tissue. Sometimes the fractured ends of the bone, if in a limb, may pass each other; in such a case the fracture can be felt with the fingers, as well as detected by the eye, and is easily diagnosed. On manipulating the parts when fracture is present, the broken ends of the bone come into contact, and passing over each other give rise to a grating sound known as 'crepitus' or 'crepitation'; in some cases this symptom is very plain, but in a part clothed deeply by muscular tissue a fracture may exist and crepitus not be discoverable, especially if much swelling has occurred; in fracture without displacement it is almost, or quite, impossible to discover the presence or exact location of the fracture, although the practitioner may feel very positive of its existence.

Treatment.—There is good reason to believe that a fractured bone in the lower animals can be repaired in much less time than would be occupied in the union of a similar fracture occurring in man; but the treatment of fracture in the lower animals is rendered a matter of great difficulty on account of the trouble in applying and retaining splints and other appliances, also on account of the difficulty in keeping the patient quiet. In some cases, if the animal be one of small value, the practitioner had better advise its destruction. On the other hand, if the animal is a valuable one it may be worth while to treat the case. As a general thing, compound fractures cannot be treated successfully. Having examined the case and decided that fracture is present, the practitioner must endeavour to bring the fractured ends of the bone into position, and the sooner this is attempted the easier it will be to effect. Having done this, splints must be applied in such a manner as to retain the fractured ends in complete apposition. Bandages may also be applied, being formed of cotton or calico stiffened with starch, gum, or plaster of Paris, and care should be taken to secure bandages of the proper size as regards width and length. The bandage should be dipped into, or have poured upon it as it is being applied, starch, gum, or plaster of Paris, either of which, on setting, or becoming dry, forms a perfectly reliable and unyielding bandage, which being, as it were, moulded to the parts, is not likely to cause any undue irritation or feeling of discomfort to the patient. Leather may also be used for splints: a nice appliance is poroplastic felt. This, on soaking a few minutes in warm water, becomes perfectly pliable, and can be moulded to the shape of the part, and on cooling becomes perfectly stiff and unyielding. The animal should be placed in slings if the fracture be in one of the limbs; if fracture of the pelvis occurs, nothing can be done except to keep the patient perfectly quiet, and assist nature as much as possible, and nature sometimes effects wonderful cures.

Modes of Union.—The mode of union, as well as the length of time occupied in repair, depends to a great extent upon the bone fractured. At first an effusion of blood takes place around the fractured ends between the periosteum and the bone. After a certain time this sanguineous effusion is removed by absorption. An exudation of lymph takes place, the reparative material is deposited between the fractured ends of the bone, and is known as the callus. The callus increases in hardness from day to day, until it finally becomes as hard as any bone, and then the process of reparation is completed. It is wonderful how quickly the above described changes will take place, particularly in the dog. The process of repair takes place very rapidly indeed if the fractured bone be a small one; it is, however, somewhat tedious if the fractured bone be a large one; but if the fractured ends are placed and retained in proper position, and the animal not too old, union is only a question of time.

Dorsal Spines.—The dorsal spines are liable to fracture. A fracture here is generally due to an ill-fitting saddle. Often in old horses ankylosis of the dorsal vertebræ exists and is manifested by a peculiar stiffness of the back, well shown when the animal turns around. The back descends to a certain extent. (On casting such a horse fracture of the bodies of the vertebræ is very likely to occur, and will generally produce complete or partial paralysis. If the fractured parts separate and press upon the cord, the animal will be unable to rise, and complete paralysis may occur. On pricking the animal with a pin, he shows no sign of having felt it. The hind-legs can be moved about in any direction, or placed in any position without the slightest resistance being offered by the patient. The fæces, etc., may be passed involuntarily.) The symptoms of fracture of the lumbar vertebræ are about the same. There is often sweating of the skin over the seat of fracture.

Treatment.—If the case is diagnosed to be fracture of one or more of the superior spinous processes, the detached portions of bone should be cut down upon and removed, and if the bone is found to be diseased it should be touched with dilute hydrochloric acid, and afterwards treated antiseptically; if the bodies of the vertebræ are fractured, as a rule, nothing can be done.

Sacrum: Fracture of the Transverse Processes.—Fracture of the transverse processes of the sacrum is caused by slipping, etc. The animal may start a little quicker than usual and cause this fracture. Muscular contraction will also cause it, and sometimes such a simple thing as the animal placing his foot upon a stone or slight inequality of ground, is sufficient.

Symptoms.—There is difficulty in moving. Before very long it is observed that the haunch falls to a certain extent. There is no well-marked crepitus in connection with this fracture, for obvious reasons. If the parts swell very much, and the constitutional symptoms are manifested in a severe form, the prognosis should be unfavourable; if no constitutional symptoms of a severe character are manifested, the prognosis may be favourable, and the probabilities are that a cure can be effected in the course of two or three months. In some cases, after a cure is accomplished, the action of the animal may be impaired for life. However, in many cases, if treated properly and cured, the action will be as good as ever it was.

Ilium.—Fracture of the supero-anterior spine of the ilium is one of the most common accidents of horse-flesh. It is usually caused by the animal running through a doorway, or other narrow place, and striking the part against the door-frame. It may also be caused by a fall, kick, etc. This injury is one not attended with serious results, and is manifested by swelling and slight difficulty in progression. After recovery is complete the part presents a slightly sunken appearance, the animal being said to have a 'dropped hip.'

Treatment.—On account of the presence of the powerful muscles of the part, it is a matter of extreme difficulty to get a proper union of the fractured ends. The patient should be placed in a quiet, airy, loose-box, and kept as quiet as possible. In a great many cases union takes place not by the aid of ossific material, but a fibro-cartilaginous deposit is made, constituting a union by what is known as 'false joint.' This should always be looked for and pointed out in making an examination as to soundness. If the animal is not kept quiet, caries or necrosis may set in, rendering it necessary to open up the parts and remove any diseased or detached portions of bone that may be found. In some cases suppuration occurs and a discharge takes place, and persists for months, or a discharge may last a week or two and the parts heal, and in another week or so suppuration reappear. This may go on for an indefinite period. In such a case the probability is that there is a piece of detached bone or other foreign substance there which is keeping up the irritation, and the treatment is to open up the parts and remove the offending agent. After the animal recovers it does not seem to interfere with his action or usefulness to any great extent, and consequently he should not be much depreciated in value for working purposes.

Fracture of the dorsum of the ilium is generally due to muscular contraction, a fall, etc. When this fracture occurs the haunch immediately falls, on account of contraction of the muscles of the part. There is also swelling, which is very extensive in some cases.

Treatment.—The animal is to be kept as quiet as possible. It may be necessary to use slings, after which apply fomentations followed by a plaster or charge.

Fracture of the shaft of the ilium is caused by falls, muscular contraction, etc. This fracture is usually of an oblique character; sometimes the slightest slip is sufficient to cause it.

Symptoms.—There is considerable difficulty in progression, but the animal is in many cases not nearly so lame as might be expected. There is difficulty in bringing forward the limb, and the haunch, by virtue of muscular contraction, is drawn downwards to a certain extent. Crepitus can be detected on applying the ear and having the limb moved, or by having the horse moved from side to side. Make an examination per rectum, and have the limb moved at the same time. The prognosis is usually favourable, especially if the patient be young and strong, and the constitutional symptoms are not very severe.

Treatment.—Perfect quietude on the part of the animal is essential to success. He may be placed in slings; fomentations should be freely used; a plaster or charge may be applied; a mild dose of laxative medicine may be given if necessary. The food should be of good quality, etc.

Ischium.—The shaft of the ischium is the portion most liable to fracture, and the fracture generally passes through the foramen ovale. This fracture is also caused by slipping, falling, a false step, etc.

Symptoms.—There is considerable difficulty manifested in the act of progression. The haunch descends to a certain extent, but not so much as in some of the previously described fractures. Crepitus is present, and can be detected in the usual way. If the pubis is involved the pain is more severe, and the prognosis not so favourable.

Fracture through the Symphysis Pubis.—This fracture is usually caused by the leg slipping outward, and is oftenest met with in winter. It is a little more difficult to detect than some of the fractures previously described.

Symptoms.—The animal has great difficulty in moving the limb. One, or generally both limbs, are turned out to a certain extent. Examination per rectum, and moving the animal is the way to diagnose it. If the animal be one of little value the owner should be advised to destroy it. If the animal be a valuable one treatment may be tried.

Treatment.—Treatment of this fracture is rather troublesome. The patient must be kept very quiet, and the hind limbs are to be drawn together and secured by means of a strap or a soft cloth passed around the hocks. Any constitutional symptoms that may arise are to be combated in the usual way; nothing else can be done, except to exercise patience and give the animal time in which to recover.

Fracture of the tuberosity of the ischium is caused by blows, kicks, falls, and occasionally it may be caused by muscular contraction.

Symptoms.—The animal shows difficulty in progression, there may be considerable swelling, etc. Recovery generally takes place in due course; in some cases caries or necrosis takes place, and treatment for these conditions will have to be adopted. In examining a horse as to soundness, this condition should not be overlooked. It is best noticed by standing on one side of the animal. However, it does not as a rule injure the usefulness of a horse, and more especially if he is to be used for farm or other slow work.

Acetabulum.—When fracture of the acetabulum occurs, the case is generally hopeless, as acute pain and permanent lameness usually result. It is caused by muscular contraction, falls, kicks, blows, etc. In most cases the limb can scarcely be moved at all, the foot rests upon the toe, or is not placed to the ground at all, the limb is shorter than its fellow, owing to its having slipped out of place and being drawn upwards by muscular contraction, the pulse is quickened, great pain is manifested by the patient, and, on moving the limb, crepitus in a well marked degree is found to be present; considerable swelling takes place externally and internally.

Treatment.—As stated before, treatment is generally useless. If the animal be valuable, it may be treated, and a partial cure in some cases effected. Place in slings, use fomentations, anodyne applications, charges, plasters, etc., and exercise patience. In any of the above fractures, if the patient has a quick and weak pulse, coldness of the extremities, the mucous membranes blanched, etc., accompanied by considerable pain, it indicates that some of the bloodvessels are injured, that internal hæmorrhage is taking place, and death usually ensues.

Scapula.—The tubercle on the spine of the scapular sometimes becomes fractured. This fracture is usually caused by an injury, by external violence of some kind, kicks, etc., but it is never caused by muscular contraction. Necrosis is the usual result of this fracture, and is manifested in the usual way by suppuration, etc.

Treatment.—Cut down upon and remove any detached or diseased portions of bone, and treat antiseptically.

Fracture through the neck of the scapula sometimes occurs, and may be caused in a variety of ways.

Symptoms.—The animal can scarcely move the limb. In some cases crepitus can be detected, swelling takes place, considerable pain is manifested, etc.

Treatment.—If the fracture be of the variety known as simple, it can be cured; but it will take a long time, and will be a great deal of trouble. The animal is to be placed in slings, and kept perfectly quiet. If the fracture extends into the articulation, the case is usually hopeless, the only chance being the exudation of material to cover it up. Necrosis of the scapula also occurs sometimes.

Humerus. Fracture of the humerus is caused by falls, kicks, and severe injuries, such as are sustained sometimes in running away. As a general thing, fracture of the humerus is incurable on account of the powerful muscles attached to it, as these pull the fractured ends out of place in spite of any appliance that can be used. Even where it is a simple fracture, treatment is rarely attended with success, and then only in a young animal.

Symptoms. The fractured ends of the bone are drawn past each other; the limb is shortened, and the animal is unable to place any weight upon it; the patient manifests great pain; crepitus may, or may not, be well marked. Sling the patient, and apply a charge. Fracture of the external tuberosity on the shaft of the humerus sometimes occurs; the symptoms are slight pain, swelling, etc. If not removed, necrosis will finally occur, in which case it becomes necessary to make an opening with a knife, and, having found the detached or necrosed portion of bone, it is to be removed. The wound is then treated antiseptically.

Elbow.—Fracture of the humerus or radius, but more frequently of the ulna, may occur, extending into the elbow-joint. It is most commonly met with among dogs, but occurs among other animals; in horses it may be due to inordinate muscular contraction, is also sometimes caused by kicks, blows, falls, runaways, etc.

Symptoms.—This fracture may be hard to diagnose, and it is almost, if not quite, impossible to state the exact condition of the injured part. The animal is scarcely able to bear the slightest weight upon the limb; as soon as he does so he drops half-way to the ground; there is considerable swelling, much pain, and in some cases well-marked constitutional symptoms; there is great difficulty in moving, and he stands with the leg in a semi-flexed position. Soon extensive swelling and inflammation follow. The mode of diagnosis of this fracture recommended by Mr. Anderson, of Glasgow, is excellent; the only objection being the danger of the experiment, as the animal is liable to fall upon the person who makes the test. Mr. Anderson's test is as follows: When this fracture is suspected, the practitioner is to place his knee firmly against the knee of the injured limb, and is to exert sufficient pressure upon the semi-flexed limb to straighten it and keep it in that position, which being done, an assistant is to lift up the other fore foot. If fracture of the olecranon be present, the animal will be unable to stand.

Treatment.—If a case is undertaken the animal should be placed in slings; the parts should be placed, if possible, in proper position, and maintained there by bandages, splints, etc. When the process of caries or necrosis takes place the diseased or detached fragments of bone are to be cut down upon and removed, as described above. But, as a rule, advice should be given to destroy the animal, as the treatment of this fracture is not usually attended with success.

Radius.—Fracture of the radius is usually due to direct injury, as a kick, etc. Occasionally it may occur as a result of concussion. Sometimes a complete fracture of the radius may occur without the fractured ends becoming displaced. If a case is met with where the animal has received a kick and is manifesting great pain, although there can be discovered no displacement and no crepitus is present, the practitioner may nevertheless make up his mind that fracture is present, and that the fractured ends of the bone are held in position by the periosteum.

Treatment.—Place the animal in slings, and apply starch, or plaster of Paris bandages, or in some cases the limb may be wound around with a tarred rope, or splints of various kinds may be used, as leather, wood, felt, etc.; but what is probably better, and in most cases necessary, is to use splints, or an iron apparatus reaching from the foot up to the elbow, and firmly holding the parts in position.

Osseous deposits are frequently met with in connection with the knee, due to an ossific diathesis and to injuries, etc.

Symptoms.—When the animal is trotted the knee is not flexed as it should be, and on flexing the joint the pad of the heel cannot be made to touch the elbow. They are incurable.

Fracture of the knee is caused by kicks and falls, concussion, slipping, etc., the small bones being often broken into several pieces. As a rule, when fracture occurs as a result of concussion, it is the worst form, and usually occurs when the horse is playing during frosty weather. If the horse is only an ordinary one destruction should be recommended; however, if the patient be an animal valuable for breeding purposes, it is worth while to attempt treatment.

Symptoms.—There is extensive swelling, and the lameness is very great. The animal shows evidence that he is in extremely great pain. On manipulating the parts the presence of crepitus is detected. Sometimes one bone only is fractured.

Treatment.—The animal should be given absolute rest for as long as it seems necessary. Plaster of Paris, or starch bandages may be applied, and the animal placed in slings. After a few weeks' rest the patient may be gently exercised, in fact exercise is necessary, as in its absence ankylosis is very apt to take place. The latter is a common sequel.

Metacarpals.—Fracture of the large metacarpal bone is easily diagnosed, and, if simple, can as a rule be successfully treated by using splints, bandages, etc., placing the animal in slings, and enjoining perfect rest and quietude. The small metacarpal bones are liable to fracture, and more especially are the apices of these bones subject to fractures from injuries inflicted by the animal upon himself.

Symptoms.—During progression much lameness is manifested by the animal. The lameness is excessive, suddenly developed, and remains for some time. The diagnosis is assisted by noticing the animal's action and by manipulation.

Treatment.—All that is necessary in any case is to apply any ordinary bandage and keep the patient quiet for some little time.

Sesamoid Bones.—Fracture of a sesamoid bone is a serious injury, and is most likely to occur from a violent sprain, as in galloping. If the patient be an animal valuable for breeding purposes, treat the case; if not a valuable animal, it is best to advise destruction. If the bone be fractured and displaced, the case may generally be regarded as hopeless.

Os Suffraginis.—Fracture of this bone occurs usually from concussion, and very rarely from direct injury. This bone suffers fracture oftener probably than any other bone in the body. It may occur very simply, as by an animal, whilst galloping, stepping on a stone or some little inequality of ground; it suddenly falters, and on an examination it is found that the os suffraginis is fractured. It is a very common accident among racehorses and hunters, and in England in particular.

Symptoms.—There is lameness to a greater or less extent. The animal can scarcely throw any weight upon the limb. Generally crepitation can be heard, but longitudinal, transverse, or oblique fracture may exist without crepitus being discoverable. In undertaking a case the practitioner should take into consideration the age of the animal, and whether it will be able to do its work after recovery.

Treatment.—Place the bones in position, apply bandages or splints, use plaster of Paris casts, place in slings, etc. If the fracture is near the lower end of the bone, ankylosis of the pastern-joint is likely to occur.

Os Coronæ.—Fracture of the os corona is of rather frequent occurrence, but is not so common as fracture of the os suffraginis. The causes, symptoms, and treatment are about the same as those of fracture of the os suffraginis.

Os Pedis.—Fracture of the os pedis is caused by concussion, and occurs most frequently among running horses. While running they suddenly falter and pull up dead lame. Soon very great heat can be felt around the coronet, and on tapping with a hammer great pain is manifested. Nothing can be done except to rest the animal, and endeavour to combat inflammation. In the majority of cases it is an act of mercy to destroy the animal.

Ribs.—The ribs are liable to fracture from external violence, as falls, blows, kicks, etc. It often occurs without being suspected. As a rule the case progresses favourably. It has been noticed in the case of an animal that was halter cast and ribs broken, that he walked in an angular manner. During treatment quietude is essential, and, if considered necessary, a bandage may be applied around the body.

Sternum.—The sternum is rarely fractured, but is more subject to caries, due to inflammation caused by punctured wounds, etc.

Symptoms.—There is more or less swelling. After a time pus is formed, and discharged pretty freely, after which the discharge dries up to a certain extent, and again breaks out. It continues this way indefinitely.

Treatment.—The treatment consists of cutting down upon and removing the diseased parts of the bone with the bone-spoon or forceps, and touching with hydrochloric acid, after which treat antiseptically as a common wound.

Femur.—Fracture of the neck of the femur constitutes a very serious condition, and in a majority of cases renders the animal useless. It is caused by casting and securing for operations, slipping, falling, etc.

Symptoms.—There is observed shortening of the limb, considerable swelling and heat, pain, crepitation, difficulty in moving the limb, etc. If the trochanter major be fractured, there is difficulty in extending the limb.

Fracture of the trochanter externus is manifested by symptoms very similar to those of the condition previously described. The treatment consists of keeping the foot in a natural position, quietude, etc. Fracture occurring through the shaft of the femur constitutes a hopeless case, except in certain rare instances where the horse is young and every other circumstance is favourable. Afterwards the injured limb is usually shorter than the other.

Patella.—When fracture of the patella occurs, it is generally due to direct injury or muscular contraction, etc., and the fracture may be longitudinal or transverse.

Treatment.—As a rule treatment is useless, and the animal should be destroyed.

Tibia.—Fracture of this bone takes place oftener than fracture of any other bone of the hind extremity. It is caused by direct injury, and often occurs without displacement taking place for some time afterwards—several days in some cases, depending when strain is put upon the limb.

Symptoms.—The animal shows great pain, although the injury may appear to be slight. He throws scarcely any weight upon the limb, and, upon manipulating the part, pain is considerably augmented, and is plainly expressed by the animal. Where such symptoms are present, the practitioner is safe in saying that fracture is present. Of course, the extreme pain may be caused by laceration of the periosteum, which may also be inflamed; but treatment for fracture is the safest plan.

Treatment.—Quietude is essential. Tie the animal up in the stall, and keep there for some time; bandage the limb. Professor Smith says: 'A case came under my observation where the fracture was treated for nine weeks. The animal seemed to be getting well. The owner took him out and rode him, and in two hours complete fracture with separation occurred. If the animal had been rested a month longer he would have been cured.'

Fibula.—Fracture of the fibula gives rise to troublesome lameness.

Symptoms.—Obstinate lameness. No swelling, heat, or other sign can be detected which will enable one to diagnose it with certainty.

Treatment.—Tie the animal up, and do not let him lie down. Foment, bandage, etc., and in six or eight weeks recovery may be expected.

Os Naviculaire.—Is sometimes fractured by concussion, punctures, etc.; hard to diagnose in a neurotomized foot. Complete recovery never occurs.

Tarsus.—Fracture of one or more of the tarsal-bones frequently occurs, and is caused in various ways. Fracture of the cuneiform bones may be caused by hard galloping, pulling up very short, turning suddenly, etc.

Symptoms.—There is great lameness and much pain, accompanied by heat, swelling, and sometimes crepitus. In other cases crepitus is not discoverable.

Treatment.—The history of the case should be ascertained, that is, the practitioner should endeavour to find out how the accident occurred, as such knowledge will materially assist in making a correct diagnosis. The animal should be placed in slings, and hot or cold applications, at discretion, used freely. Perfect quietude should be enjoined, the patient should be dieted, and all unfavourable symptoms met and combated as they appear. In a short time an osseous deposit will be thrown out, and frequently a pretty good recovery will be the result.

Fracture of the astragalus sometimes occurs. It may be caused in various ways, as by kicks, etc. If the fracture extends into the hock-joint, the case is hopeless.

Os Calcis.—Fracture of the os calcis is usually caused by direct injury, or violent muscular contraction. Separation of the fractured ends of the bone may or may not occur.

Symptoms.—Crepitus may be present in some cases, absent in others. There is well-marked lameness, and the animal manifests considerable pain. Swelling is present in a greater or less degree. In most cases a large quantity of ossific material is thrown out, and an abnormal enlargement is the result.

Treatment.—Place the patient in slings; apply plaster of Paris, or starch bandages, etc. In many cases it is better not to apply bandages, that is, in such cases as they cannot be kept in position, and consequently irritate the patient. A stiff pitch plaster or charge answers better. In case complete separation of the fractured ends of the bone takes place, it is, as a rule, advisable to have the animal destroyed.

Metatarsal Bones.—Fracture of these bones is usually produced by direct injury, in some cases the external wound being of a very trivial nature indeed. In all long bones there are three centres of ossification—one for the shaft known as the diaphysis, and one for each of the extremities known as the epiphyses. The parts sometimes separate in young animals. The treatment is to keep the animal quiet, sling, apply plaster of Paris bandages, and allow plenty of time for the separated portions to reunite.

Inferior and Pre-maxilla.—Falling may fracture either the inferior or pre-maxilla, or either may be fractured by getting a hook in it and pulling back, and it may sustain a fracture—rarely, however—during the operation of extracting teeth. If the pre-maxillary bone sustains a fracture by, say, a hook, remove any teeth that are loosened, bring the soft parts together as well as possible, and apply a light calico bandage. Bind with flexible, soft wire, and support the patient on liquid food for several days. If the inferior maxilla be fractured, the treatment is about the same. When the patient be a male, the presence of the canine teeth will be of material assistance, as they serve to support the wire used in retaining the fractured parts in position. The patient should be fed from a shallow vessel, and supported on a liquid or soft diet for several days. Care is to be taken that the fractured portions do not again separate, and, if no untoward accident happens, recovery will take place in a very short time. In the dog the parts are held in position by a well-padded wire muzzle, and the animal fed with a spoon, syringe, or tube.

Necrosis of the Lower Jaw.—The lower jaw is often injured by the action of the bit, especially if a powerful curb bit is used and the animal hard to restrain. The superficial layer of the bone may be fractured, and necrosis result.

Symptoms.—There is a dribbling of saliva, swelling of the mucous membrane, and considerable heat and pain in the part. The animal also manifests a considerable amount of irritation and annoyance. The treatment is to open up the parts, scrape with a bone-spoon, and remove any diseased bone that may be found. The other jaw may be affected in the same way. Sometimes abscesses form in these parts, and sinuses form and burst outside. Open up freely, scrape, and syringe with astringents (as Zinci Chlor. lotion) and antiseptics.*

Ramus of the Lower Jaw.—Fractures of the ramus of the lower jaw may be caused by blows, falls, kicks, etc.

Symptoms.—Mastication is rendered difficult, or even impossible. There is considerable swelling, and on manipulating the parts crepitation may be heard.

Treatment.—Bring the parts into position, and endeavour to retain them; a very good apparatus to apply to keep the bones in position is the cradle first recommended by Professor Varnell, of London, and of which a good description may be found in Williams's 'Surgery.' Thin strips of bass wood, acted upon by water and applied to the parts, do very well; or gutta-percha may be moulded to the parts after they have been brought into position, and is an excellent agent for retaining the fractured ends in position. The face cradle spoken of above is, however, the best apparatus for the purpose. On applying it, it must be stuffed with some light material, as cotton, tow, etc., to prevent it causing irritation or sores. After fitting the cradle, it is to be secured by means of some elastic material, which will cause the maintenance of an equable pressure upon the parts. The patient is to be supported by liquids at first, after which soft food may be given. The case should be closely watched to see that reunion is taking place in a proper manner, as in case it does not take place properly, the jaw of the animal will be deformed, the teeth will not come into position, or meet properly, and he will be troubled with sharp and projecting teeth, owing to unequal wear.

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* If the swelling is suspected to be due to the presence of the parasite of either Actinomycosis or Discomycosis, give either Biniodide of Mercury or Potassium Iodide (or both) internally, apply Ung. Hydrarg. Biniod. externally, or, if the swelling has been opened, use Liq. or Tr. Iodi. and water (1 to 10 or 20) as a lotion to syringe with.

Nasal Bones.—Fracture of the nasal bone is usually of the variety known as comminuted fracture, and is always due to direct injury, such as may be sustained in running away and coming into contact with some hard object, as a fence or wall.

Symptoms.—Sometimes the bones are driven into the nasal sinuses, and more or less hæmorrhage ensues.

Treatment.—Endeavour to bring the bones into position, and, if not a compound fracture, apply an adhesive plaster over the fractured parts. If driven in pretty badly, a probe covered with some soft substance, as chamois leather, is to be inserted, by means of which the bones may be pressed back into their former position, after which all detached pieces are to be removed and the parts treated antiseptically. Sometimes a small hole is trephined before raising the depressed parts, and one nostril may be plugged to give support.

Frontal Bones.—Fracture of the external portion of a frontal bone, while apparently a serious condition, is really one of little importance ; but fracture of the internal division does constitute a very serious and dangerous condition. However, fracture of both the outer and inner plates of a frontal bone may occur, and when it does it is of the variety known as comminuted, and is always due to direct injury, such as may be received in running away, etc.

Symptoms.—With every inspiration and expiration the bone may be seen to move up and down, and there is more or less hæmorrhage ; the pulse and appetite do not seem to be affected in the slightest degree. The above symptoms are when the outer portion alone is fractured, and the inner division remains intact.

Treatment.—Bring the bones into position as well as possible, and apply an adhesive plaster if the fracture is not 'compound.' In ten days or so recovery will be complete. If a compound fracture, any detached pieces of bone are to be removed as soon as possible, and the wound thoroughly cleansed and syringed with antiseptics. Cold irrigation from a hose-pipe is exceedingly useful, followed by chinosol (gr.ss.-gr. i. to ℥i.), or Zinci Chlor. (grs. ii.-iv. to ℥i.). Neglect is apt to give rise to nasal gleet.

Orbital Processes.—This fracture is also caused by external violence in some of the ways before mentioned, and it may produce opacity of the cornea.

Treatment.—Endeavour to raise the bones into position, and, if not a compound fracture, apply plasters for the purpose of retaining them in position. If 'compound' remove all detached or necrosed bone, and treat antiseptically.

Frontal Bone.—Fracture of the internal division of the frontal bone is caused in the same manner as the fracture previously described.

Symptoms.—The animal on receiving the injury may fall, and remain down for a few minutes, then get up and appear to be all right, and in two or three days afterwards show certain cerebral symptoms. In a case of this kind the prognosis should be unfavourable. It can only be treated by keeping the patient quiet, and if any portion of bone be considerably depressed, it should be raised to its proper position. The food should be of a cooling nature, cold application should be made to the seat of the injury, and a cure may be effected. Antiseptic or sedative lotions such as those of chinosol, lead, zinc, etc., should be applied externally, bromides or other sedatives given internally, and the patient kept quiet.

In fractures uniting by what is known as false joint (that is, by means of a fibrous deposit between the fractured ends of the bone, instead of an osseous deposit), and more particularly in false joint occurring in the dog, the prognosis must always be guarded. Even if the false joint has existed for a month or six weeks, it is worth while in small animals to put the leg in a splint and gum or plaster bandage, at the same time administering full and regular doses of some preparation (such as Syr. Phosphat. Co.) containing calcium and iron salts. The leg should be kept bound up for at least six weeks or two months. If there is no union after this, the parts should be operated upon under antiseptic precautions.

Parietal Bones.—Fracture of the parietal bones occasionally occurs, and death results. Whenever the practitioner has reason to believe that a bone is pressing upon the brain, he should cut down, trephine, and remove it if necessary. Nowadays, with modern antiseptic surgical procedures, this operation can be performed with a very fair prospect of success.

CHAPTER XI

Diseases affecting the Bones (*continued*)

ACTINOMYCOSIS

THIS disease, when affecting the tongue, is commonly spoken of as schirrhus or wooden tongue, and it used to be known as 'cancer,' or sometimes (incorrectly) 'osteo-sarcoma.' It is very commonly met with in some parts of England, especially the fen districts of Lincolnshire and Cambridgeshire. When there are swellings of the bones of the jaw or glands of the throat it is sometimes spoken of as a 'wen,' or sometimes as 'lumpy jaw.'

Causes.—Actinomycosis is known now to be caused by the attack of vegetable parasites known by the name of 'actinomyces,' or 'ray fungus.' The parasite gets into some wound of the mucous membrane, possibly in many cases caused by the teeth, and produces the disease. It is particularly said to have its resting-place on barley-straw, and the sharp barley awns are sometimes blamed for causing the preliminary abrasions by which the parasite gains access into the system.

Symptoms.—The ravages of the disease, as a rule, are most seen in connection with the tongue and glands of the throat or submaxillary space. They become swollen and very hard. The tongue in some cases is so large that the poor brute becomes suffocated, and the nostrils are often likewise affected. The hard glands may suppurate and burst, the purulent discharge containing the actinomyces in fair quantity, so much so that in some cases the pus feels quite gritty. If neglected, the cow will become very much emaciated, and ultimately die of exhaustion or suffocation. If a little of the pus, stained with methyl blue, is put under the microscope, the ray or club-shaped rods of the actinomycosis fungus can readily be discovered.

Treatment.—The disease used to be looked upon as incurable. Now, however, thanks to the researches of Professor Thomassen, of Utrecht, the discovery of the value of potassium iodide has proved to be specific, and the animal placed under this treatment will commence to improve at once in a marvellous manner. More recently, Professor Edgar, of Dartford, has shown that the use of biniodide of mercury is very much cheaper and attended with almost as good results. For an ordinary-sized cow, if iodide of potash is used alone, a fair average dose is two drachms twice a day. With biniodide of mercury from two to six grains dissolved in water, with the aid of ten or twelve grains of potassium iodide, is the proper dose. If potassium iodide is continued indiscreetly for too long a time, the skin becomes covered with a thick layer of bran-like scales, and in the case of the mercury biniodide the hair may fall off. Neither of these results are, however, permanent.

OSTEOPOROSIS

This is a non-malignant disease of bone, and of a non-inflammatory type; it is very commonly known by the name of 'big-head.' It consists of a porous condition of the bones, which are increased in size without proportionally increasing in weight—in fact, the probability is that while the bone increases in size it decreases in weight. In most cases of the disease the bones of the extremities are affected and become enlarged, fragile, and often, on very slight exertion, will give way. The disease attacks young animals, ranging in age from six months up to four years; hence it is described as essentially a disease of growth. It is very seldom that the disease is developed in an animal over four years of age. At Jobstown, New Jersey, the young horses of Mr. Lorillard suffered severely from this disease. It affects all breeds of horses alike. It is said by some to be due to a deficiency of the salts of lime. I do not think so myself, as frequently horses suffer with the disease in the famous blue grass region of Kentucky, where the grass grows only a few inches above an abundance of limestone, and the water is also highly impregnated with lime. It is also said to be due to feeding with maize, or Indian corn, and hay grown on low-lying lands. There is undoubtedly an enlarged condition of the vascular elements of the bone, and a decrease in quantity of the salts of lime. Almost, or quite every bone in the body, in all probability, is more or less affected; in many cases there is a local cause for it, as it is of far more common occurrence in certain localities than in others. Professor Smith says that two cases only have come under his observation in Canada, and in both cases the affected animals had been fed upon food grown upon low-lying land, coarse inferior hay, etc., and had been running in a swampy pasture. This disease may possibly, in certain conditions, be due to the attack of a parasite. Elliott has observed it to be very prevalent in certain districts in the Hawaiian Islands, and was greatly impressed with the necessity for removing the animals out of those districts before any perceptible improvement could be detected.*

Symptoms.—The symptoms of osteo-porosis are not well marked at first; but it may be noticed that the animal, instead of being as bright as before, has become languid, and becomes gradually reduced in condition. The muscular system becomes somewhat soft, the muscles feeling flabby, or softer than in health, and after a while they become more or less atrophied—the muscles of the scapular and gluteal regions more particularly. The bones of the jaw and face are noticed to be slightly enlarging on one side, and in some cases pressure on the nasal chamber takes place, irritation is set up, and a nasal discharge follows; and occasionally the air-passages of the head may be encroached upon to such an extent that breathing is rendered very difficult. In many cases it may be noticed that, when the animal is down, it can rise only with difficulty, and often when being driven along may fall, and a fracture easily occur; hence it is, by the readiness of the bones to break on the slightest cause, that we know the whole osseous system is affected.

Treatment.—Remove the affected animal from the sound ones, and change the food, no matter how he has previously been fed; and in the case of an animal sufficiently valuable to justify such a course, change of climate will be found of great benefit. Advise a journey to some part of the country four or five hundred or a thousand miles away, and try mineral tonics, acids, alkalies, etc.; feed the animal with roots, etc. And something may be prescribed to apply to the parts; but local applications are, in my opinion, of no value. A change of climate has been known to cure osteoporosis.

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* *Journal of Comparative Pathology and Therapeutics*, vol. xii., p. 300.

RICKETS

Rickets, or Rachitis, occurs in all kinds of young animals, but is of more frequent occurrence in puppies than the young of other animals. It is generally thought to be due to a deficiency of earthy, and an excess of animal, material in the bones.

Causes.—The disease shows a tendency to occur among the progeny of stallions or dogs that have been overdone in stud service; and it is more likely to appear in weakly or unhealthy animals, and more especially if the trouble be one of an hereditary nature. Poor milk, or milk deficient in certain constituents received from the mother, may also be mentioned as one of the causes of rickets; weaning the young animal at too early a period, and forcing him to eat food that is only fit for an adult animal to eat, and that is not only unfit for the nourishment of a young animal, but is incapable of being digested by such an animal; or the disease may occur as a result of any cause having a tendency to weaken the animal. And there may be some other causes of which we are not aware.

Symptoms.—The bones bend unnaturally on account of the excess of animal and deficiency of earthy material which they contain; the fore-limbs bend outward and the hind limbs bend inward; and in the horse there is a strong tendency to curb, bursal enlargements, bog-spavin, etc., and the joints usually become enlarged to a greater or less extent. There is also general weakness and debility, and perhaps irregularity of the bowels, which is speedily followed by emaciation, which after awhile becomes extreme ; in a well-marked case affecting the horse the fetlock may descend nearly to the ground on the outside, and there is stiffness and considerable difficulty in progression.

Treatment.—The treatment of rickets must be both local and constitutional, and to be successful must be energetic and persevered in, regardless of trouble, etc., until a cure is effected, or it becomes plain that the case cannot be treated successfully. If the milk of the mother is suspected to be the cause of the trouble, or is found to be deficient in any of its necessary constituents, the defect may be remedied by changing or increasing the food of the mother, and by giving her alteratives and tonics, and taking good care of her generally. The administration of alteratives and tonics to the foal should not be neglected, and is sometimes followed by very beneficial results ; iron, gentian, quinine, etc., may be given to both foal and mother in appropriate doses. If the bowels are irregular, a slight laxative may be administered ; if acidity of the stomach be present, alkalies should be given, and there is none better than lime water, which may be combined with linseed or castor oil, where there is any tendency to constipation, and given in the usual doses at proper intervals. The limbs are to be supported ; sometimes a simple bandage, properly applied, suffices for the purpose ; where it will not, use splints. Keep in a nice level paddock, and give food which tends to make bone, as lime water, cod-liver oil, syrup of phosphates, oatmeal, etc., to foals, and a cure will often result.

MOLLITIES OSSIUM

Definition.—An abnormal softening of bone, due to the presence of a largely preponderating quantity of animal matter, and a correspondingly small amount of earthy material within the bone substance.

It is very difficult to say what causes operate in the production of this disease; probably the food and water have something to do with it. It also is very possible that a predisposition to the disease may be transmitted by a sire or dam to the progeny. Its presence is thought by some veterinarians to depend upon or be connected with melanosis.

'There was a gray horse brought to the infirmary a few years ago that was suffering from this disease, and it was at first thought that the trouble was due to carious teeth, but afterwards the true condition was discovered. It was a case of mollities ossium; the bones of the jaws were very soft and cartilaginous, and in this case at least, I think, it was due to a melanotic condition' (Smith).

Symptoms.—There may be observed difficulty in mastication, which gradually becomes better marked as the disease progresses. The bones become more or less enlarged and take on a soft and cartilaginous character; there may also be a discharge, which is usually profuse and of a very offensive character.

Treatment.—As no means are known by which a cure can be effected, treatment should not be attempted except by way of experiment.

FRAGILITAS OSSIUM

Definition.—An unnaturally hard and fragile condition of the bones, due to fatty degeneration of the animal matter, leaving a superabundance of earthy material in the bone.

When this change takes place the condition is a very obvious one, and plainly discernible, after death, in the cancellated tissue of the bones. Old horses have a predisposition to this trouble.

Symptoms.—The disease chiefly affects old horses. The animal moves stiffly, and may have a roached back; he shows a tendency to ring-bone, spavin, etc.; when down has difficulty in getting up; if you cast such an animal or he falls, fracture of some of the bones is almost sure to result.

Treatment.—Like the previous condition, it is incurable, and therefore useless to treat.

Enchondroma.—This consists of a cartilaginous growth occurring in various parts of the body, often in connection with the stifle, and in cattle it is frequently noticed in connection with the ribs. It is a non-malignant growth, and does not, as a rule, interfere much with the animal's usefulness, and he will remain in pretty good condition for some time; at other times it will increase to such an extent that destruction of the animal becomes unavoidable.

SPLINT

A splint consists of an exostosis situated on the side of the cannon, usually on or between the large and small metacarpal bones, and generally situated about the lower portion of the upper third of the bone. It may be an ossification of the interosseous ligament between the bones. Frequently it involves the articulation between the large and the small metacarpal bones, and when close to the knee-joint it is likely to set up more or less irritation in connection with the articulation, and give rise to ulceration. The high splint is therefore the most serious, and according to whether the splint is high or low in situation, an opinion is given as to the likelihood of lameness ensuing. Much more importance is attached to them in young than in old horses. Splints may and do occasionally occur on the outside of the fore-leg, and also occur in connection with the hind-leg.

Pathology.—Splint is an enlargement due to more or less inflammation of the periosteum, and possibly a circumscribed inflammation of the bone itself; as a result of which an exudation is thrown out. The exudation is at first of a gelatinous character, and as it proceeds takes on a cartilaginous character, and gradually increases in hardness, and changes in character, until finally it becomes ossified, constituting a splint.

Splints are oftenest met with in young animals, owing to the greater vascularity of the parts. Some animals have a predisposition to splint, due to an ossific diathesis. A horse with a weak or a badly-proportioned limb, as when the metacarpals are a little long in proportion to the length of the radius, is also more liable.

Causes.—As above stated, some animals are predisposed to this, as well as to other bone diseases; and in many cases there undoubtedly exists an hereditary tendency to splint, spavin, etc. Splints on the outside of the limb are more likely to be met with affecting 'in-toed' or 'pigeon-toed' horses, in such animals the centre of gravity being thrown more to the outside of the bone affected. Horses with a high and pounding action are also more likely to have splints than horses with a low or cat-like action, particularly in localities where the roads are very hard. External injuries of various kinds, as kicks, blows, etc., will also cause splint. Speedy-cut may be mentioned as an occasional cause of splint, but the most prolific cause is concussion, due to riding or driving on a hard road. Country horses coming to the city usually develop splint very quickly, and it is very common amongst city horses. Occasionally splint is met with in a horse ten or twelve years of age, but such a case is rare, its occurrence being most common in horses ranging from two to five or six years of age; and a horse at the age of three or four years may have a well-defined splint of considerable size, for which no treatment is pursued, but the animal is used until he is eight or nine years of age, when in many cases partial absorption of the splint will be found to have taken place, and, although the splint still exists, it may be a matter of considerable difficulty to discover its presence. Improper shoeing tends to produce splint. Besides the ordinary splint there is what is known as 'double' or 'pegged splint,' consisting of an exostosis upon each side of the limb, with an osseous communication running from one to the other. This form is often very troublesome to treat, and must be carefully guarded against when examining for soundness. In many cases splint may be developed to an enormous size without producing lameness in even the slightest degree; but in most cases splint causes lameness at some time or other in the majority of cases when forming. It also causes lameness when a nerve tendon, or ligament, is interfered with by the exostosis, especially if the horse is used for fast work.

Symptoms.—A knowledge and recollection of the structure of the parts will materially assist in arriving at a correct diagnosis. The symptoms of splint are somewhat peculiar, and it is generally when an animal is lame that the attention of the practitioner is called to the case. When the exostosis is of any size it is very easily detected; but as a rule splints are more likely to produce lameness when inflammation is beginning, and therefore it is usually the small splints which cause lameness. The animal walks almost or quite sound, and drops very much when being trotted, and more particularly if trotted on hard ground, and in some cases where weight is placed on his back, as a rider, for instance. He should be allowed to trot along quietly with his head hanging loosely, or allowed [illegible]ect freedom of motion, in which case he will be seen to drop in his action, and if the animal is young the fact is to be received as confirmatory evidence of the presence of splint. However, a further examination should be made. The hand should be passed down over the usual seat of the exostosis, and an endeavour made to detect the presence of the splint by manipulation. This often takes up considerable time, as in many cases the splint is found to be no larger than one half of a pea. Having found any abnormal enlargement, press upon it with the fingers and at the same time observe whether the animal flinches; or tap on the suspected part, and if it be splint, the animal will by flinching manifest pain, and on being trotted out immediately afterwards it may be observed that the lameness is increased. Be careful in diagnosing this, as well as every other form of lameness. The animal may have both corns and splints, etc., but in splint there is no abnormal degree of heat in the foot. Negative as well as positive symptoms are of the utmost value in the diagnosis of this as well as other forms of lameness. In some cases there may be noticed a little deposit in connection with the knee. This is a very troublesome form of splint.

Treatment.—The treatment of splint is usually very satisfactory. Unless the splint is actually producing lameness, it should be let alone, except when of great size and constituting what is usually designated an eyesore. In such a case, if the owner wishes to have it removed, the practitioner may cut down upon it, and remove the enlargement by means of the bone forceps. In some instances a case has to be treated while the animal is kept at work. The shoes should be removed and replaced by low-heeled shoes. Hot or cold applications at discretion are useful. In case the animal can be allowed to rest during the treatment it will be much better. A dose of laxative medicine may be of great benefit in some cases, but as a rule it is not needed. Cold water, applied by means of a hose turned upon the part for an hour or two every day, is valuable to allay irritation, after which an anodyne lotion, composed of Tr. Arnicæ and Liq. Plumbi, āā ʒi., Aquæ Oi., may be applied; or a good active vesicant, as the Unguentum Hydrarg. Biniodidi, 1 to 4, or 1 to 8, or the Ungt. Cantharidis, may be used—either will be found excellent vesicants, and of much benefit in splint. A seton passed over the splint, and allowed to remain for a couple of weeks or so, will often effect a cure where every other treatment fails. The hair should be clipped or shaved off the spot before a vesicant is applied. Half an ounce of the ointment may be used, and should be applied with friction for at least ten or fifteen minutes. The parts below are to be guarded in the usual way. After the vesicant has expended its force, if it be found that tenderness is still present, another vesicant is to be applied. The seton is perhaps a preferable mode of treatment where the splint is situated close to the knee. On removing the seton the horse may show signs of improvement; but there may be some slight lameness yet, in which case the application of one or two vesicants will often effect a complete cure. It may be necessary in some cases to use the firing-iron; in such a case an iron with a sharp point is to be recommended as preferable to any other. After heating it, pass the point right into the osseous enlargement. A cure generally results. Subcutaneous scarification, or periosteotomy is often attended with beneficial results, and is very useful, particularly where a splint is suddenly developed in a horse of mature years. The operation is very simple, and consists of making an incision through the skin. Through the opening thus made the periosteotomy knife is inserted, and the periosteum covering the splint is incised, and pressure is relieved. A poultice should then be applied for a few days.

Sometimes a seton is applied at the same time. If it is desired to try to keep the animal at work, apply some sedative or stimulating liniment, according to the degree of inflammation present. Lead and opium or arnica make a useful sedative lotion, whilst ammoniacal, camphor, or soap liniments make valuable and non-irritating stimulants. Sometimes Tr. Iodi, Ung. Iodi, Ung. Hydrarg. Fort., or Ung. Hydrarg. Oleat., are used. Wet cloths applied around the splint and covered with dry ones will in many cases be sufficient to allay and keep down irritation; but rest is generally essential, and should be given if the case is to be treated properly. When a splint becomes fully developed, that is, attains its maximum size, etc., irritation ceases, and with it, as a rule, the lameness.

SORE SHINS

The condition known as sore, or bucked shins, consists of an inflammation of the periosteum covering the metacarpal bones, and consequently it is a form of periostitis. It is astonishing from how many forms of periostitis horses suffer. It is analogous to splint, but differs, inasmuch as the inflammation of splint is circumscribed, while in sore shins it is more or less diffused. The inflammation is not always confined to the metacarpal bones, as in some cases the knee, and occasionally even the radius, become affected.

Pathology.—The exciting cause having operated, inflammation is set up in the periosteum, as a result of which an exudate is thrown out, usually taking place between the periosteum and the bone, but sometimes it takes place external to the periosteum. The enveloping membrane of the bone becomes more or less thickened, and in some cases the inflammation is so severe as to terminate in necrosis, especially in neglected cases, and where the exciting cause has been kept up. Sore shins is of more frequent occurrence among racers than any other class of horses, and although occasionally met with among horses used for ordinary purposes, it may be said to be almost confined to those of fast work, as racehorses, hunters, etc., and then is only rarely met with in horses of mature years, being chiefly found affecting the young animals. It oftenest occurs in the leg with which the animal leads off in galloping.

Causes.—Sore shins are caused by violent and oft-repeated concussion, such as horses, and more particularly young horses, are subjected to whilst undergoing their gallops in training for races. A horse with heavy pounding action is far more likely to suffer than a horse with light action. The gallop is the gait most productive of sore shins, and certain tracks, as a very hard track for instance, is far more likely to cause it than a turf or other soft course. Sore shins are very likely to follow a severe gallop down grade, as the strain is so much greater on the fore-legs, as well as the concussion being more severe, and more directly in connection with the structures affected in sore shins. A heavy-bodied animal, or one in gross condition, with light limbs, suffers very readily.

Symptoms.—The symptoms are pretty plain in the majority of cases, but sometimes a case is met with that is very puzzling. It is astonishing how many different forms of lameness this trouble will give rise to. The inflammation may be in connection with the lower, middle, or upper third of the metacarpal bone, or the whole of the parts mentioned may be inflamed simultaneously; and in a few cases the radius may be affected, or the inflammation may be situated close to the knee, or may even exist in connection with the carpus itself. Usually the first symptom noticed is lameness. The animal has had his work, has been cooled out, and is noticed to be slightly lame. A bandage is applied, and the lameness disappears. Such a symptom is to be regarded as premonitory of sore shins; still, the real trouble may not as yet be suspected. However, before long it becomes more apparent. The animal on being trotted out moves rather stiffly, and the stiffness is seen to be more particularly in connection with the affected limb, which is not extended as freely as usual by any means. There may be observed a slight swelling, due to the presence of an exudate. The swelling extends down the anterior aspect of the metacarpal bone, and gives it a slightly curved appearance. There is a considerable amount of heat present, and the most delicate manipulation of the parts will cause the animal to flinch, as the pain of sore shins is most excruciating; so severe is it that in some cases simply pointing at the limb or attempting to pick up the foot, will cause the animal to run back. During progression the animal drops very much in his action. Another peculiarity of the lameness is that where it is slight the animal will warm out of it, and where it is severe exercise will mitigate it. In some cases the trouble may be below the fetlock joint, and in connection with the os suffraginis. If the condition be neglected, and the exciting cause kept up, the exudate may increase in quantity, and finally become organized. Thickening of the periosteum may occur, and the slightly curved appearance mentioned above may become permanent, but lameness ceases, and it does not necessarily constitute an unsoundness.

Treatment.—The treatment of sore shins should commence from the very earliest appearance of the trouble. Absolute rest is essential. In a case that is, or promises to be, severe, the inflammatory action may be lessened by the administration of a laxative, which may be followed by diuretics. If the food has been of a stimulating character, change it, and give a cooling diet. Where the pain seems to be very severe, long-continued fomentations will do much to relieve it; or anodyne applications, as Liq. Plumbi, Tr. Opii, Tr. Arnicæ āā ʒi., Aquæ Oii., may be applied. A free use of refrigerants, as ice, or spring water, or water turned on from a hose, is of very great benefit in the majority of cases, allaying pain and fever. Plumbi Acet. in solution is also of benefit. After the irritation is allayed, counter-irritation is to be employed, the usual one of Unguent. Hydrarg. Biniod. being probably the best, to be used as often as necessary; exercise gently, etc. In exceptional cases the exudate is very extensive. In such cases make an incision and allow it to escape; but one should not be too rash, or precipitate in the use of the knife. The wound is afterwards treated with astringents or antiseptics. There is no particular specific for sore shins.

SPAVIN

Spavin may be defined to be an exostosis involving the hock-joint, and is usually described as being situated on the antero-internal aspect of the hock, but in a majority of cases extends around and involves the whole of the articulation. Any two, or more, of the bones composing the articulation may be involved. Properly speaking, there is no such disease as 'blood spavin,' and when professional men speak of spavin, 'bone spavin' is meant in every instance, for the simple reason that no other kind of spavin is recognised by the profession. Spavin is confined to the hock-joint, and is described as 'low spavin' and 'high spavin,' according to its situation, the former being situated between and involving the metatarsal and cuneiform bones, while the latter involves the astragalus and cuneiform bones, and of the two varieties is the least amenable to treatment: either form may, or may not, be accompanied by ulceration. The hock-joint is one of the most powerful, complicated, and at the same time beautifully arranged joints in the body, and the enlargement of spavin is situated on the antero-internal aspect of the hock, because this is near the centre of gravity, and consequently here it is that the greatest force is brought to bear during progression, and in support of the posterior portion of the animal's body.

Pathology.—The cause being present, and having operated, inflammatory action is set up, and Nature, in her efforts to effect a cure, throws out an exudate which, becoming ossified, firmly unites the diseased osseous structures, constituting anchylosis, which, when completed, is usually followed by cessation of irritation, etc. The inflammation is set up in the cancellated tissue, but extends to and involves the articular lamellæ, which gradually undergoes destruction, and anchylosis, as described above, finally occurs. As a rule, there is no enlargement to be seen in connection with high spavin; any enlargement that occurs being seen usually in connection with low spavin. The high spavin is usually associated with ulceration of the articular surfaces of the bones, and destruction of the articular cartilages. In some cases the ossific matter is deposited between the bones, and not the slightest external enlargement can be discovered.* On the other hand, enormous deposits, extending completely around the articulation, are often met with. So long as the true articulation escapes, the animal may go comparatively sound; after the hock has once suffered from spavin, it can never be restored to its natural condition. There are many nostrums sold for the purpose of removing and curing spavin; but such an object cannot be effected by any power with which we are acquainted.

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* Such a case is termed an 'occult,' or 'articular,' spavin. There is a particularly good illustration of this in the Museum of the Royal Veterinary College, London, in the skeleton, which is 'set up' there, of Mr. Chaplin's noted racehorse, 'Hermit.'

Causes.—The causes of spavin are predisposing and exciting. The predisposing causes are an hereditary tendency, heaviness of body, especially when such a body is associated with light limbs; and in some cases there may be an ossific diathesis. Certain conformations predispose, as that of a horse possessing weak hocks and abnormally long metatarsal bones, such a horse being considered to be more liable to spavin than a horse of different conformation. A horse having a hock narrow from before backward is also considered to be predisposed. The exciting causes are hard and fast work. In the case of an injury to one of the hind limbs, causing the animal to stand upon the sound limb, the latter becomes liable to spavin in consequence of the extra weight thrown upon it. It is produced in hunting horses by the severe strain and concussion the hock is subjected to by the animal jumping, etc., while carrying a heavy weight. Spavin is often noticed in young animals long before they have reached maturity, and in such a case it is generally due to an hereditary tendency; but it may be produced in the colt by allowing it to run along with the mother while she is being worked on a hard road or hillside. Improper shoeing—as shoeing with high heels and toes—and concussion from any cause whatever, may be mentioned as exciting causes of spavin. Driving a horse day after day upon hard roads is likely to cause it, particularly if the horse be young or is driven rapidly. Country horses, on being brought in and put to work in the city, have a strong tendency to develop all forms of exostoses of the limbs.

Symptoms.—Often two veterinarians, well qualified in every respect, will express conflicting opinions as to whether a horse is spavined. One will pronounce the horse spavined, and the other will declare him free from spavin, and each be perfectly conscientious in his opinion, and certain that he is right. From this the reader may infer that the diagnosis of spavin is not always a matter of ease and certainty; on the contrary, is often a matter of extreme difficulty. Usually, the first symptom to attract attention is slight lameness, and the animal rests the limb at intervals for some time before more positive symptoms are presented. In examining for a spavin, the eye will be found to afford valuable aid. The animal should be made to stand firmly upon all four of his feet—in some cases it may be necessary to have an assistant hold up one fore-limb, so as to cause the animal to stand squarely and firmly on both hind-feet; the fore-foot should also be held up as a precautionary measure, as the horse may be a kicker, or may kick at a total stranger when he would not at the owner or groom. Stand near the shoulder and look at the hock, or look through between the fore-legs; and if there is any abnormal enlargement or irregularity of outline, difference in size, etc., as a rule it will be readily detected. A view of the hock should also be taken from the other side, as well as from behind the animal. Besides the above, a manual examination should be made, by passing the hand down over the hock, examining carefully for any abnormal enlargement; at the same time note the presence or absence of heat in the part—as a rule, considerable heat is present in connection with high spavin, and often there is no perceptible enlargement. Pressure over the parts may elicit some manifestation of pain or uneasiness. If there is an exostosis of considerable size, it will be detected without any difficulty. On observing the animal as he stands quietly in the stable, it is noticed that he favours the affected limb, standing with it flexed, etc. The lameness of spavin is characteristic. On causing the animal to move over in the stall, to move about from side to side, etc., it is noticed that he drops on the affected limb; but on being made to walk or trot, it is noticed that he drops on the sound limb. When first brought out, after standing all night—particularly if the animal has been subjected to a severe or tiring drive the day before—it is observed that the animal is stiff and lame; but when driven half a mile or so the lameness disappears or decreases in severity, to use a common expression—'he warms out of it.' This is characteristic of joint affections. On trotting there is a peculiar rising and falling of the croup; and in cases of long standing there will be atrophy of the muscles of the haunch, which should not mislead the practitioner, or cause him to think the lameness is in the hip, etc. The animal also goes upon the toe, and wears this portion of the shoe abnormally. During progression the hock is not flexed as freely as it should be, and there seems to be a slight difficulty in flexing it. The practitioner or an assistant should flex the joint for a few minutes, and immediately trot the animal out, when, as a rule, if spavin be present, he will show greater lameness than before. Every practitioner should familiarize himself with sound and unsound hocks as much as possible, such knowledge being very essential to a correct diagnosis. On being called to a case of lameness and finding an enlargement on the hock-joint, the practitioner should not jump at the conclusion that the lameness is due to spavin, as it may be due to the presence of a nail in the foot, etc.; hence in all cases it is advisable to make a searching examination of every part of the limb, and if nothing abnormal is found in connection with any part except the hock, the negative evidence thus obtained will be found of great value in diagnosing the case.

Prognosis.—The prognosis should be always guarded. A careful examination should in every case be made, and if it is a low spavin, in a well-formed hock, and there is no great lameness, the patient not more than seven or eight years of age, and other conditions favourable, recovery may be expected; but if it is found to be a high spavin, occurring in a badly-formed hock, and the animal has been lame for months, it will be very tedious, and difficult to treat successfully. Spavin in every form constitutes an unsoundness. A horse may, however, do any reasonable amount of work without the spavin hurting him or seeming to cause any great inconvenience. Properly speaking, a cure cannot be effected, as the limb is never restored to its original condition after having been attacked by spavin; but when a cure is spoken of, it is meant that the severe lameness is relieved, and all irritation in connection with the hock-joint ceases; and to attain these results all treatment is directed.

Treatment.—The animal is to be given a long rest; remove the shoes, and make a free use of hot or cold applications if there is irritation. It is better to place the animal in a loose box having a soft floor than on pasture; by doing this the animal is not able to move about a great deal, and the articulation is thereby kept quiet, an important consideration in the treatment of all joint affections. After the irritation is allayed, a free use of counter-irritants is to be recommended. As a vesicant there is nothing better than the Ungt. Hydrarg. Biniod., which may be washed off in three or four days, and another application of the same kind made, and so on as long as may be deemed necessary. It must be borne in mind that the treatment recommended is not to remove the enlargement, if any be present, nor is it pursued with a view of restoring the hock to its normal condition; on the contrary, it is intended to set up a new, or increase the existing, inflammatory action, and thereby hasten the process of anchylosis. The actual cautery, as the firing-iron, is the next resort in the treatment of spavin, is probably the best, and is certainly the most efficacious, of all methods of treatment; the bunting-iron* or feathering iron, preferably the former, may be used. There is also another very useful kind of firing-iron with five or six points. In large spavins the iron is to be used freely, so as to set up considerable irritation. Place a twitch upon the lip, or in some cases it may be necessary, and in all cases no more than prudent, to cast the animal to control him whilst being fired. If the feathering-iron be used the strokes should not be made too close together, or sloughing will be almost certain to follow. The pointed or bunting-iron is very useful in many cases, especially where the spavin is of large size. Having heated it, it should be inserted well into the enlargement, and no danger of untoward results need be apprehended. From three to half a dozen points may be made. This iron is useful when the irritation is circumscribed in character, while in cases where the inflammation is diffused the feathering-iron is probably the best. Firing is a very old method, and has been employed in the treatment of spavin for hundreds of years. The punch is also used occasionally at the present day, and was first recommended by Professor Dick, of Edinburgh. In many cases setons appear to have a good effec[illegible] re desirable, as they leave no blemish. A seton whe[illegible]d should be inserted right over the seat of the enlargement, passing under the integument for a distance of about two inches. An irritant ointment, as cantharides, is to be kept on the seton, which may be allowed to remain for three weeks or a month, after which it should be removed, and the wound allowed to heal. Tarsal tenotomy is also recommended, and is of great benefit in many cases if the inflammation is circumscribed, but will not do if it is diffused and the whole hock affected. In using the firing-iron it is advisable to fire all the way around the articulation, but the lines or points should not be made so deep in front as on the outside and inside. A great many so-called specifics are sold for spavin, and some are no doubt useful, as they are counter-irritants, but on the whole they are frauds. As a last resource, perform either (or both) anterior or posterior tibial neurectomies.

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* Pyro-puncture.

RING-BONE

Ring-bone may be defined to be a ring of osseous material extending around the limb just above the hoof. Inflammation is set up usually in the cancellated tissue of the bone, and the same changes take place as in spavin. Ring-bones are described as true and false, true ring-bones being further subdivided into low and high; it is known as low when it involves the coffin-joint; and high when it involves the pastern-joint, and also when (as in some cases) it extends up to and involves the fetlock-joint. The term 'false ring-bone' is applied to any osseous enlargement in this region, other than those affecting the articulations. An enlargement may appear as a result of kicks, blows, etc., but if none of the articulations are involved it by no means constitutes a serious condition. Ring-bone may occur in a fore or a hind limb, but probably occurs with greatest frequency in the hind limbs.

Pathology.—The condition generally arises from an injury which causes an inflammatory action to take place in the cancellated tissue of the bone. The inflammation extends to and destroys the articular lamellæ, after which destruction of the articular cartilage takes place, the tendency being to complete destruction of the joint. Nature, in her efforts to effect a cure, throws out an exudate, which undergoes ossification. The joint becomes obliterated, the bones formerly composing it gradually unite, anchylosis becomes complete, and all pain and irritation usually then ceases.

Causes.—The causes of ring-bone may be said to be predisposing or constitutional, and exciting. Extreme crosses are said to be productive of this, as of some other conditions, as, for instance, a thorough-bred horse being allowed to serve a number of common heavy draught mares, or a heavy coarsely-bred horse put to a number of light mares, the progeny of such crosses frequently being troubled with ring-bone, spavin, etc. Hard work is probably the most prolific of all exciting causes, especially in localities where the roads are very hard. Improper shoeing, blows, kicks, etc., all operate as causes of ring-bone. In cases where an animal receives a puncture in the foot, or while suffering from lymphangitis, etc., is compelled to rest upon the sound limb for a week or ten days, it is not uncommon for a spavin or a ring-bone to result. Horses of certain conformation, as those with upright pasterns, are predisposed.

Symptoms.—The natural enlargement of the part is sometimes mistaken for a ring-bone by a careless or ignorant person, and in consequence many a poor horse has been put to much needless torture in an effort to cure the supposed ring-bone before the trouble was discovered to be somewhere else. The careful practitioner will never make such a mistake. Occasionally a well-developed ring-bone will suddenly make its appearance without any appreciable lameness having ever been manifested, but as a rule lameness of a pronounced character is manifested during the period of development. Preceding the appearance of the enlargement, when it occurs in a fore extremity, and is situated near the very sensitive structures, the patient steps on his heel, and endeavours to remove all weight from the toe; and when the ring-bone occurs in a hind extremity the animal steps on his toe, and during the act of progression great care is manifested in bringing forward the foot. The enlargement may be very slight, so slight in some cases that it is only by the closest examination, and a careful comparison of the sound with the unsound limb, that it can be detected. The enlargement is usually soft. Considerable heat is also present, and there is more or less lameness, which may be increased by flexing the joint and trotting the animal.

Treatment.—The treatment of ring-bone is similar to that of spavin. Counter-irritation in some form or other is to be employed. If the foot is out of shape, endeavour to bring it as nearly into its proper shape as possible. Hot or cold applications should be applied to allay irritation, after which use the firing-iron, as being the best form of counter-irritation. In the treatment of ring-bone all efforts are to be directed towards hastening anchylosis. Plantar neurectomy may be tried, and it is very often successful. If the parts are fired lightly, apply a vesicant immediately afterward; if fired deeply, do not apply vesicants for four or five days afterwards. A vesicant, by the way, will not act for some time after firing, as the flesh loses its vitality for a while. Place on the foot a bar-shoe with a low heel. If the animal remains lame after treatment, the practitioner should not despair, as he may go to work, and the lameness gradually decrease, and finally cease. 'In many cases where I have blistered and fired repeatedly with only slight improvement (the animal being put to work), lameness eventually ceased' (Smith).

OSSIFICATION OF THE LATERAL CARTILAGES

This condition is also known by the more common name of 'sidebones.' The lateral cartilages consist of two fibro-cartilaginous plates or sheets, situated partly within and partly external to the hoof, the anterior edge being in connection with the navicular joint, and the postero-inferior border with the deeper parts of the foot. They are designed to allow expansion of the heel to take place when the foot is placed upon the ground, and serve to restore the heel to its original shape on the foot being removed from the ground. These cartilages are subject to inflammatory action, as a result of which they may become ossified, and give rise to a very troublesome lameness.

Causes.—Sidebones are of much more common occurrence in heavy than in any other class of horses—the Clydesdales, Normans, etc., being the most frequent sufferers. In some animals, sidebones may be due to an hereditary tendency; and, as the predisposition can be transmitted from the sire or dam to the progeny, an animal affected in this way should never be used for the purpose of breeding. Ossification of the lateral cartilages occurring in a heavy draught horse does not constitute a very serious condition, generally speaking, and unless causing lameness the animal may be passed as sound. However, in making an examination, attention should be called to their presence. On the contrary, if met with in a light horse, whether producing actual lameness at the time or not, the animal is to be classed as unsound, for the reason that, on being put to fast or road work, especially where there are hard roads, lameness will appear. Hard work and concussion will cause sidebones, and going faster than a walk tends to produce it in heavy draught horses. The plough horse that goes in the furrow frequently suffers. The most prolific cause in light horses is fast work, and more particularly when on hard roads. Sidebones may also be caused by injuries, as a tread, bruise, puncture, etc., by which the lateral cartilages are injured, causing inflammation to become established in the parts, and the various changes to take place which result in ossification.

Symptoms.—Sometimes the inflammation is of a very mild character, and the process of ossification very slow, in which case ossification of the lateral cartilages may take place without any appreciable lameness or irritation ever having been observed. But such a case is the exception and not the rule. The condition is oftenest met with in the fore-foot, very seldom occurring in the hind limb. In some instances the cartilage becomes considerably enlarged, giving rise to an external enlargement, which may be easily seen ; in other cases no visible enlargement can be detected. On manipulation, the cartilage, which in health is very flexible, is found to be inflexible, hard, and unyielding to the touch. During progression the toe of the foot is first brought to the ground, and there is—in case both fore-feet are involved—a peculiar stilty action and stiffness of gait, somewhat resembling that of navicular arthritis. There is also, during the inflammatory stage, great heat and tenderness of the parts, especially where the animal is worked or the exciting cause kept up. In some cases suppuration may occur. After ossification is completed, the sidebones are liable to fracture the same as any other osseous structure. In certain cases, ossification of the lateral cartilages gives rise to incurable lameness, so long as nervous sensation exists in the part.

Treatment.—First remove the ordinary shoe, and endeavour to bring the foot as near its natural shape as possible. If it be at all out of shape, rasp down the inferior part of the foot, more especially at the heel, as the animal shows a tendency to go upon the toe. Heat and irritation should be allayed by poultices and other soothing applications. The actual cautery may be used ; but there is little necessity for its employment in most cases. Mild or, if thought necessary, pretty severe counter-irritation may be tried, and is usually attended with benefit. Cut down the wall of the hoof, and apply a light three-quarter shoe in such a manner as to throw the weight on the frog, and outside of the foot. If possible, the animal should be allowed a long rest. In France an operation is often performed, which consists of removal of the ossified structures by excision ;

but such an operation has some considerable drawbacks; one reason, and perhaps not the least, is that the operation is not always successful in removing the lameness, and in such a case it is not only useless, but may be productive of a great deal of harm. The operation of plantar neurectomy is far preferable, almost uniformly successful, and is rarely followed by bad results. The operation of grooving the hoof, introduced into England by Veterinary Lieutenant-Colonel Fred Smith, A.V.D., has given some excellent results.

EXOTOSES NEAR JOINTS

Exostoses frequently occur in the proximity of joints. They are often irregular in shape, size, and outline, and are formed by the solidification or ossification of an exudate which has been thrown out in consequence of some inflammatory action which has previously taken place in the part affected. They probably occur with greater frequency in the neighbourhood of the fetlock than other joints, and are more commonly met with in racehorses, or horses of hard and fast work, or those subjected to concussion of the parts by travelling on hard roads, etc.*

Symptoms.—There may be observed more or less swelling in the region of the joint. There is lameness, which may be severe, manifested during trotting, but which is not well marked, or may be absent, during walking. There is heat of the parts, and tenderness is manifested on flexing the joint. The primary symptoms are very similar to sprain of a ligament, for which the trouble may be easily mistaken.

Treatment.—Hot or cold applications will relieve for the time being, that is, until the animal is again exerted. Allay irritation, and treat the same as for other exotoses. Prognosis as to complete cure from lameness must be guarded. Application of blisters and actual cautery are often successful. As a last resource perform median or internal plantar neurectomy.

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* The cab-horses of London seem particularly predisposed to this form of exostosis. The cabmen term the exostosis a 'bobby' (or 'bobbit') bone.

CHAPTER XII

WOUNDS

A WOUND may be defined to be a solution of continuity of the soft structures. Wounds may occur in any part of the body, and are variously described as incised, punctured, lacerated, contused, gun-shot, and poisoned. Wounds are frequently met with which are both lacerated and contused, and similar combinations of the other varieties may likewise occur.

Incised wounds are those in which the soft structures are smoothly divided by means of a sharp-edged or clean-cutting instrument, such as a knife, etc. The length of an incised wound is greater than its depth. If cut in a direction parallel with the course of a muscle, the edges do not separate to any great extent; but in cases where the muscle is divided transversely, it contracts, drawing the lips of the wound apart, making a much worse appearance than when the wound extends longitudinally; and the wound extending transversely is also, as a rule, of a more serious character, causing more trouble, and occupying a longer period during the healing process.

Punctured wounds are such as are inflicted by means of a sharp or blunt instrument, as a stick penetrating the soft tissues, and may be caused in many ways, as by animals running through brush heaps, jumping paling fences, etc. This variety of wound is characterized by possessing a depth greater in extent than its width. It is also of a more dangerous character than an incised wound, and every wound of this kind should be regarded with suspicion, as, although the visible portions of the wound may appear small and trivial, hæmorrhage of a fatal character may be taking place in its deeper portions, or an injury sufficient to cause death may occur without any symptoms of the serious character of the wound having been manifested at the time of its reception.

Lacerated wounds are those in which the soft tissues are more or less torn. Not only the skin and areolar tissue, but in many cases the muscles, are torn to a considerable extent, or may be partially cut and partially torn. Lacerated wounds are usually caused by coming into contact with some sharp body, or by a kick from another horse, running into or through a barbed wire fence, being very common in localities where this fencing is much used. As a rule, this class of wound is not attended with any serious results.

Contused wounds are commonly called bruises, and are those wounds in which the skin is not injured to any considerable extent, and in some cases is merely abraded; but the deeper structures are more or less involved, and a certain amount of sanguineous effusion takes place. A good example of a contused wound is 'speedy-cut.' The part being struck, more or less extravasation of blood takes place according to the severity of the injury. A clot is formed, which either causes suppuration or is in due time removed by absorption. A black eye, so common amongst certain classes of men, is also a familiar example of a contused wound.

Gunshot wounds are of rare occurrence, except during the progress of a war, and then, of course, are of very frequent occurrence, and are caused by the discharge or bursting of firearms. A gunshot wound may be followed by inflammation, mortification, resolution, death, etc., or the function of a part may be partially or wholly destroyed, either at the time the wound is received, or several years afterward; or the part itself may be lost, and the presence of the lead, in cases where it is retained in the tissues, may give rise to a species of slow and progressive poisoning.

Poisoned Wounds.—This variety of wound most frequently results from the bite of some venomous reptile, as the rattle-snake, copper-head, viper, etc., in America, and the cobra, etc., in India, and may be caused by the immoderate and injudicious use of caustics, as arsenic, etc., being introduced into the part—a favourite practice with some in the treatment of spavin, fistulous withers, etc. I have heard of a case in which a poisoned wound of a frightful character was produced by the application of a toad to a splint, by which means it was expected that the splint would be cured, the enlargement disappear, etc.

Treatment.—The treatment of wounds varies to a considerable extent, and is governed by the situation, nature, variety, and extent of the wound under consideration. If it is an incised wound, accompanied by a considerable amount of hæmorrhage, the first procedure is, of course, to arrest the hæmorrhage. This object is effected in different ways, according to whether the bleeding vessel be an artery or a vein. If the open vessel be an artery, the blood will be of a bright red or florid colour, and is ejected with spurts, spouting out with every beat of the heart. If the hæmorrhage be from a vein, the blood will be of a darker red, and flows steadily. Arterial hæmorrhage may be arrested by pressure applied between the wound and the heart, or by taking hold of the vessel with forceps and applying a ligature. If the artery be one of small size, bleeding may usually be stopped by completely dividing the vessel, when, as a rule, its ends retract, and the flow of blood ceases. Torsion may also serve to check the bleeding where the vessel is not of too great size. It is said to be against the principles of surgery to ligate a vein, but in many cases there may be no other resource. Pressure should here be made on the side farthest away from the heart. The use of styptics, as lead, acetate, alum, tannic acid, perchloride of iron, very hot or very cold water, the actual cautery, etc., are all of considerable use in some cases of both venous and arterial hæmorrhages. After hæmorrhage ceases, remove all foreign bodies, if any be present, and if the wound be dirty, it should be carefully and thoroughly cleansed with cold or warm water containing some antiseptic* of reliable strength, after which the edges are to be brought together and secured, which is usually done by means of sutures, the interrupted suture being usually the best for wounds in animals.

Sutures may consist of wire, either of tin, silver, or some soft metal coated with silver. These are known as metallic sutures, besides which there are sutures of silk, catgut, etc. All should be rendered aseptic before use. For any ordinary wound, silk thread will do as well as any of the other materials mentioned. The suture-needle should be of a medium size. As a rule, those commonly used are too large. Sutures are further described as pin sutures, quilled glover's, interrupted, uninterrupted, etc.

The **Pin Sutures** is the form of suture usually employed to close the wound in the neck after the operation of phlebotomy. In the absence of a special pin, which can now be procured, an ordinary strong pin may be used. The edges of the wound are to be cleansed and then secured in place by means of the pin, which in its turn is to be retained in position by waxed hair, or silk, preferably the latter, which is wound around the pin after the manner of a figure eight (8).

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* Amongst the most common and reliable antiseptics in general use are carbolic acid, creolin and its numerous preparations, chinosol, izal, corrosive sublimate, sulphate or chloride of zinc, and permanganate of potash.

Quilled Suture.—This variety of suture consists of two pieces of whalebone, wood, or some similar material, one on each side of the wound, and connected by a silk thread, wire, etc. It is the form of suture usually employed in ruptured or lacerated perinæum, and is very useful in large wounds where the lips have a tendency to gape, and considerable force is required to prevent the wound opening, the ordinary suture in such cases being liable to tear out. Two goose or fowl's quills answer very well.

Glover's Suture.—In this suture the stitch is passed from within outwards, in the same way in which a glove is stitched, hence the name. It is a form of suture not much used, as the suture [illegible]s between the edges and retard healing.

Interrupted Suture.—This suture is formed by passing the silk or wire through the edges of the wound, drawing them together and tying the ends of the suture. By this method each stitch is separate from and independent of all the others; consequently if one or more stitches break, sufficient may still be left to retain the edges of the wound in position. This is the best of all forms of sutures for ordinary purposes.

Uninterrupted Suture.—This suture consists of one continuous thread, forming all of the stitches from one end to the other of the wound; hence it is known as the 'uninterrupted suture.' It is objectionable for the reason that if one stitch gives way, on account of the thread separating, they all give way, and allow the lips of the wound to gape.

In sewing up a wound, the practitioner should have the animal well secured, to prevent injury to himself. A good firm hold of the lips of the wound should be taken with the fingers, as the practitioner can get along better, and the animal will offer less resistance than if the parts are handled in a gingerly manner. A small opening has to be left at the most dependent part of some wound, to allow of proper drainage, the free escape of pus, etc. Other ways of securing wounds are by plasters, straps, and bandages; but on account of the presence of the hair, and the powerful action of the panniculus carnosus muscle which render adhesion difficult, plasters are not often used.

Strapping.—This is done by causing a number of pieces of calico, of proper size, shape, etc., to adhere to the parts by means of an application of pitch or some similar adhesive. Strapping is sometimes of great assistance in affording support to sutures, especially in extensive wounds, where it is feared that the sutures may give way.

Bandaging.—Wounds of a certain kind are readily secured and the edges kept in perfect apposition by means of bandages. Bandaging consists of binding or securing a part by means of a roll or sheet of some material, usually calico or rubber. Incised wounds, such as those made for the purpose of performing neurotomy, are readily secured and the edges kept in place by a properly adjusted bandage; one advantage being that a bandage, as a rule, leaves less blemish than the sutures. Bandages also serve a useful purpose in preventing access of dirt, flies, etc., to wounds, and afford a useful support in many cases to sutures. In treating wounds, the divided edges should be always brought into perfect apposition, and the practitioner should have his mind made up as to where the first stitch should be inserted. If the wound is not properly stitched, and the parts brought into perfect apposition, an ugly pouch or wrinkle may be left to constitute an eyesore, and be a source of aggravation to the owner of the animal.

Dressing of Wounds.—Most unprofessional people are imbued with the idea that there is a specific for each variety of wound. It is needless to say that such is not the case. There are some minor differences of opinion among surgeons as to the best way of dressing wounds. Some believe the atmosphere to be a medium of contagion, and claim that in it exist the germs which, coming into contact with wounds, cause suppuration, etc.; hence, in treating wounds, they make it a point to rigidly exclude the air.

Others do not believe in the above theory, consequently do not make any attempt to exclude the air, and scarcely dress wounds at all, merely having the wound kept clean, allowing Nature to do the rest. Still others recommend water-dressings, etc. The whole secret rests upon thorough cleanliness and the proper application of antiseptics.

In veterinary practice wounds do very well in many cases when exposed, but, of course, may receive some disease germs through the medium of the air; the probabilities are, however, that in a large majority of cases the air not only does no harm, but, on the contrary, often exerts a beneficial influence. Wounds in a healthy animal heal faster than in an unhealthy animal. After the wound is stitched up, the treatment must be governed altogether by circumstances. If inflammatory action be apprehended, a free use of hot or cold applications to the part will be attended with benefit; in cases where the pain is not excessive, cold water will be found preferable to hot. Inflammation, when feared, may often be prevented, and, when present, may be reduced by a dose of laxative medicine, and by giving the patient a laxative diet. As an application exerting a cooling, and at the same time an astringent action, there is nothing superior to the ordinary white lotion.* It was first recommended by the late Professor

* ℞ Zinci Sulph.
Plumbi Acetatis āā. ʒii-℥i.
Aquæ ℥xx.
M.; ft. lotio.

Dick, who had a very high opinion of its excellence. It may be reduced or increased in strength as desired or thought proper. Another very good lotion is made by carbolic acid and water (1 to 40 or 50). Oleaginous preparations are sometimes used as wound dressings. A useful application in punctures of the coronet is as follows: Tr. Benzoin., Ol. Picis. Ol. Lini., equal parts. Ointments of lead, zinc, etc., are also sometimes useful: but, as a rule, it is not advisable to use ointments on wounds of animals. If exuberant granulations spring up, nitrate of silver may be used to touch the parts with. In case the wound is indolent, and needs stimulation, the same preparation is of value. Sulphuric acid and similar applications should never be used, as they will almost invariably set up a violent and serious inflammation in the parts. As a rule wounds, unless injudiciously treated, do well in our patients.

Results of Wounds.—One sequel to be feared is tetanus; and it more frequently occurs as a result of a wound of the knee or foot, the specific organism being particularly common in the dust of roads and in soil. Tetanus usually appears just when healing is almost complete.

Erysipelas, or inflammation of the superficial and areolar structures, also occurs as a result of wounds, and is very serious when it occurs in the phlegmonous form, causing sloughing and gangrene of the tissues. Phlegmonous erysipelas usually occurs as a result of wounds in the region of the shoulder and groin; it usually manifests itself in about twenty-four hours after the reception of the wound, by swelling, etc., the pulse being weak, and running from seventy to eighty beats per minute. In such a case the prognosis is, to say the least, very unfavourable. In some cases it will terminate in gangrene and death. Erysipelatous swellings occasionally follow the use of setons, and are very undesirable occurrences, as the operator may be blamed, though unjustly, for the result.

Modes of Healing.—Wounds heal in various ways, and the mode of healing depends upon certain conditions, as the character of the wound, the way in which it is treated, the state of the patient's health, etc.

Direct or Immediate Union.—This is the most desirable way, and can take place only under antiseptic conditions, when the parts are thoroughly surgically cleansed either before the infliction of the wound or immediately afterwards. The hæmorrhage being arrested, the lips of the wound are brought together and kept in apposition. There is no great amount of inflammatory action, though possibly there may be some, and it heals in from twenty-four to forty-eight hours. This mode of healing usually occurs after a surgical operation, and can only be attained by strict attention to antiseptic surgical principles.

Adhesion, or Healing by the First Intention.—In this there is a certain amount of inflammation set up, not, however, of a severe character. Leucocytes are thrown out, and soon become converted into fibre cells. Healing by the first intention cannot take place if the inflammatory action be excessive.

Granulation, or Healing by the Second Intention.—It is by this method that many of the accidental wounds in our patients heal. The parts as a general rule are brought together in some manner or other, after which a considerable extravasation of blood and serum takes place. This escapes in the course of twenty-four hours or so. There is a great influx of leucocytes, which become converted into pus corpuscles, and the cavity of the wound begins to fill up with a substance of a velvety character. This is granulation tissue. The wound gradually heals from the bottom. Suppuration, more or less profuse, frequently takes place. What is commonly known as proud flesh is simply exuberant granulation, the granulation taking on this condition in consequence of an undue amount of stimulation. Hence even this process of repair depends on a limited amount only of inflammation being present, as, if the inflammatory action be excessive, exuberant granulations spring up, and the healing process, instead of being accelerated, is retarded thereby.

Union, or Healing, under a Scab.—This mode of healing is usually seen in connection with small and trivial wounds, as skin abrasions, etc. A little clot or scab forms over the wound. The scab is sometimes formed of blood, serum, or dirt, or a combination of two or all of them. If the scab be allowed to remain undisturbed, in a few days it falls off, when it is found that the parts underneath are healed. In cases where it is noticed that there is irritation beneath a scab, and sometimes a formation of pus, it is advisable to remove it, and allow a new scab to form. I might mention here that the absorption of catgut sutures may be deferred by encasing them in resin or wax before using.

POLL EVIL

Definition.—An abscess, usually the result of injury, in the muscles and skin in the region of the atlas. It runs on to the suppurative process, the adjacent structures gradually becoming affected, the ligamentum nuchæ being frequently involved. Little vitality exists in the diseased structures, and pus may burrow down between the muscles until it reaches and causes disease of the osseous structures. Poll evil is so called because it occurs in the region of the poll.

Causes.—Poll evil may occur in a variety of ways, and probably is caused in all cases by either direct or indirect injury of the part, as by a horse striking his head while passing through a low doorway. It may also be caused by wearing badly-fitting halters and bridles. Another cause is the yoke which is sometimes put on to prevent the jumping of fences. Blows, or anything causing violent irritation of the parts, may be followed by poll evil. It is also said to be caused by unnaturally tight reining.

Symptoms.—The injury being received, inflammation ensues, and is manifested by heat, pain, and swelling of the parts. The swelling soon becomes very considerable, and persists until the beginning of the suppurative process. An abscess forms, and pus is discharged, at which time the swelling subsides. Pipes or sinuses are formed, extending in all directions, and the poll soon becomes one mass of disease. The animal protrudes the head, more especially during the inflammatory stage, and on moving the head or handling the inflamed parts, pain is manifested. In some cases the swelling is very slight and may easily escape observation, especially as in many cases the mane serves to effectually hide its presence. This condition should not be overlooked when making an examination as to soundness. Anchylosis of the occipito-atloidean articulation sometimes takes place, leaving the animal with a permanently stiff neck. In other cases the pus may burrow, and cause death by penetrating the capsular ligament of one of the cervical articulations.

Treatment.—The treatment of poll evil varies considerably, depending upon the nature and stage of the disease at the time the case is placed in the hands of the veterinarian. During the stage of acute inflammatory action, and before suppuration has commenced, the head should be tied up, the patient kept as quiet as possible, and cold and other applications of an anodyne or soothing character are to be applied, as opium or arnica lotion, etc., in the endeavour to arrest inflammation and prevent the formation of pus. A cold-water douche, where it can be arranged, will be found of great value in allaying pain and reducing inflammation.

If the case has not progressed too far, the above treatment will often be successful. In many cases an enlargement remains after the swelling has subsided : its reduction may generally be effected by the application of the Ungt. Iodi., a stimulating embrocation, or a mild vesicant. When the disease has passed beyond a certain point and it is evident that it cannot be arrested in its course, suppuration is to be encouraged. Warm water should be freely applied. Poultices of bran, linseed meal, turnips, etc., will also be found useful, the object being to keep the parts moist and warm, by which means the formation of pus will be facilitated and pain and irritation allayed. When the presence of pus is indicated by fluctuation, pointing, etc., the hair should be shaved off and the abscess laid freely open. Care must be taken to have an orifice at its most dependent part, to allow of proper drainage. All sinuses are to be freely laid open with the knife, and scraped thoroughly with a curette. In other cases a few grains of Hydrarg. Perchlor. may be inserted. It sets up considerable irritation and a slough ensues, which often results in a cure ; or a solution as follows may be used : Hydrarg. Perchlor. grs. v.—x., Aquæ ℥i., with which the sinuses are to be injected. In all cases where it is necessary to use the knife it should be used freely, and if the ligamentum nuchæ is diseased it may be necessary to divide it. The result will be a gaping wound, presenting a frightful appearance, and the head will drop more or less ; but this need not occasion any alarm. It is usually necessary to cast and anæsthetize the patient before using the knife. Sometimes considerable hæmorrhage ensues, but it is usually from unimportant bloodvessels, and in most cases ceases of its own accord. In the event of any of the more important bloodvessels being divided, the hæmorrhage may be checked in the usual way. After laying the parts open it should be plugged with antiseptic tow or wadding, and treated antiseptically as an ordinary open wound. Treatment is usually successful, except when the bones are affected.

Halter - Cast. — Horses frequently become halter-cast, and as a rule more or less injury results. The animal usually struggles violently in his endeavours to free himself. If the animal has been cast for any considerable length of time, the muscles may lose their power of contracting, and on this account the animal on rising may not be able to elevate his head to its proper position. The head hangs down until the nose nearly, or in some cases quite, reaches to, and rests upon, the ground, and mechanical congestion of the head takes place, the lips frequently becoming swollen to an enormous degree, and respiration interfered with to a considerable extent.

Treatment.—If the animal is unable to raise his head, it should be elevated and supported in its proper place by means of a broad bandage, an ordinary sack answering the purpose very well. The swelling of the lips and other parts is to be relieved by scarifying freely, and applying cold water, etc. The neck should be bathed and well dried afterward, and in cold weather a stimulating liniment should afterwards be applied to prevent reaction. Pus sometimes forms, and should be allowed to escape; give laxatives, diuretics, etc.

PHLEBITIS

Inflammation of a vein used to be of common occurrence in the horse, the jugular vein being the one most commonly affected, as it was the vein usually selected for the operation of phlebotomy. Phlebitis is less frequently met with now than it was formerly, when bleeding was so indiscriminately practised.

Causes.—Inflammation of a vein may be caused in various ways, but probably is caused oftener by blood-letting than anything else, and is more likely to follow the operation where several blows of the fleam have been made, or when the operation has been performed in a bungling manner, lacerating or bruising the coats of the vein, improperly closing the lips of the wound, etc. Rubbing of the wound by the animal may also be mentioned as a cause. Probably, however, the commonest cause of all is the use of a fleam, or lancet, which has not been rendered aseptic before use, especially if the skin is not cleansed with an antiseptic before making the puncture. In the days when bleeding was constantly practised by quacks and unskilled persons this was undoubtedly the cause of much phlebitis. In France, where the law still permits the quack to flourish, phlebitis is still seen frequently. It is common to meet with a case where twenty-four hours after bleeding a swelling is noticed, which on manipulation is found to be movable. This is a condition often mistaken for thrombus, but it is really a subcutaneous clot.

Pathology. — In phlebitis after bleeding, inflammation becomes established in connection with the coats of the vein, causing an exudate to be thrown out. A coagulum is formed by the obstruction, the flow of blood through the vein becomes less and less, until it finally ceases, and the vein becomes impervious. The coagulum extends toward the head when it is the jugular vein that is affected ; and in the brachial vein, or other veins of the extremities, the coagulum extends towards the heart. Why the coagulum should extend in one vein toward the heart and in another vein away from the heart is an interesting problem, and one as yet for which no explanation is offered. In some cases abscesses form, and a series of them may extend up the course of the jugular vein as far as the parotid gland, and if not checked cause complete obliteration of the vein.

Symptoms.—Two or three days after bleeding a swelling is observed to exist along the course of the vein, and extending from the wound toward the head. On manipulation pain is expressed by the animal. Pressure on the vein below the wound fails to raise the vein. There may be slight constitutional symptoms manifested by a quickening of the pulse, etc. The swelling increases, and if the animal is on pasture, where the head is depressed during grazing, the swelling in some cases becomes enormous. There may be rigors more or less marked. The vein can be felt hard and corded underneath the skin, which is movable over it.

Treatment.—The treatment, to be successful, must be energetic. The horse should be tied up and have his head elevated, and fomentations are to be freely used, hot water being applied, not for five or ten minutes at a time, but for several hours at a time, after which the parts should be nicely dried, and kept warm by means of poultices. Laxative and diuretic medicines will be found useful, and may be given if the system of the animal is in fit condition for their reception. Careful attention should be paid to the diet, which should be of a cooling and laxative nature, avoiding Indian corn, etc., which tends to heat the system and increase the inflammatory action. If the case is of some standing, and abscesses have formed, they should be treated by lancing, cleansing, and the free use of antiseptics. After the abscesses have closed a blister may be applied over the source of the affected portion of the vein. Hydrarg. Biniod. may be used. A common result of phlebitis is obliteration of the vein. If it is the jugular, use the animal carefully for some time after the acute symptoms have subsided, and do not turn out on pasture, as depression of the head will soon be followed by mechanical congestion. Where one vein becomes obliterated the corresponding vein of the opposite side becomes enlarged, and takes on the function to a certain extent of the one destroyed. In examining as to soundness, test the jugulars, raising first one and then the other; obliteration of a jugular vein constitutes unsoundness, and it is a matter which must receive grave consideration. In making an examination as to a horse's soundness, it is also usual to raise the jugulars to ascertain whether the animal has ever been bled for any illness.

Subcutaneous Clot.—As before stated, this condition is sometimes mistaken for thrombus or phlebitis, but is, in comparison to either, a very trivial condition. It is usually caused by improper closure of the internal wound, etc.

Symptoms.—There is observed more or less swelling in the neighbourhood of the wound, but the swelling is of a circumscribed character, and is movable, in contradistinction to the swelling of phlebitis, which is immovable, and more or less diffused. The constitutional symptoms present in phlebitis are absent in this condition. The swelling is caused by the exudation of a small amount of blood into the areolar tissue. This exudation is from the jugular vein, and takes place in from twelve to twenty-four hours after the wound is made, while the swelling of phlebitis does not appear for three or four days.

Treatment.—Remove the pin and allow the blood to escape, after which cleanse, and treat antiseptically as an ordinary wound.

Injuries to the Neck.—The veterinarian often meets with a bruised or lacerated condition of the tissues in the region of the neck, caused by the bite of a vicious horse. The injury may seem to be of a trivial character, but, as a rule, it is not such a simple condition as it appears to be, and the veterinarian should be rather guarded in his prognosis, as in the course of a few days, instead of resolution, extensive suppuration, or even gangrene, may result.

Symptoms.—The skin may or may not be lacerated. There is usually a considerable amount of heat and swelling, the neck is stiff to a greater or less extent, and there is evidently considerable pain, as th[illegible] usually very averse to having the parts handled.

Treatment.—The head is to be kep[illegible]. Fomentations should be used freely, and, i[illegible], make an incision and allow it to escape. If [illegible] will burrow down between the mu[illegible]te one of the most troublesome conditions po[illegible] this result should occur, as it sometimes does, in [illegible]ce of improper or delayed treatment, or, as sometimes happens, the animal having received no treatment at all, an endeavour should be made to get a dependent opening to allow the pus, etc., to escape freely. To attain this object it may be found necessary to make an opening extending through from one side of the neck to the other. In some cases, a pretty good recovery may take place; in other cases a failure will be the result. Sometimes an opening will have to be made below the cervical vertebræ, setons inserted, or the parts freely incised as with sinuous wounds of the withers.

Collar Galls.—Collar galls are very common amongst working horses. They are found in the region of the neck, and are caused by a badly-fitting or rough-seated collar, which sets up irritation, resulting in painful swellings (sometimes called cold abscesses, but really due to small parasites—the discomyces), abrasions of the skin, etc., which being pressed upon by the collar cause considerable pain.

Treatment.—First remove the exciting cause, clip the hair nicely from the parts, use fomentations, etc., freely. If there is a small opening, probe it, and if deep, open it up freely. Afterwards fix the patient so that the wound cannot be rubbed, and treat antiseptically. Sore shoulders are not as simple a condition as they may appear to be. White lotion may be used with great benefit; lead or alum in solution; to which, if desired, a small quantity of tannin may be added. If it is necessary to work the animal the collar should be well padded, and should be thoroughly cleansed and dried every night. A solution of Plumbi Acet. is better than the common one of Sodium Chlorid., which, however, is of considerable benefit.

Hair Sinuses.—We sometimes meet with a well-marked sinus extending into the neck, or about the region of the shoulder, and which is lined with hair throughout its whole extent. They are readily discoverable, as they are easily seen.

Treatment.—The treatment consists in removal by means of the knife, carefully dissecting them out, after which treat as an ordinary wound.

Saddle Galls.—These are the same as collar galls, and are treated in the same way.

Sitfasts are caused by badly-fitting saddles, collars, etc. It may be the cause of a troublesome little sore that will not readily heal, but breaks out on working the animal.

Treatment.—Do not waste time with poultices, caustics, etc., but dissect the dead skin out, and afterwards use poultices, caustics, astringents, etc., to allay irritation. Rest the animal and hollow out the saddle pad before going to work again.

SINUOUS WOUNDS OF THE WITHERS

These are commonly termed 'fistulous' withers, but a fistula is characterized by having two openings, one of which communicates with a mucous surface, and therefore the old term of 'fistulous' withers is a misnomer.

Pathology.—Sinuses in the withers occur as the result of an injury, which sets up inflammation in the soft tissues in the region of the withers, and runs on to suppuration, the neighbouring structures gradually becoming affected. In many cases the superior spinous processes of the dorsal vertebræ are involved, and gradually undergo destruction, becoming carious and necrosed.

Causes.—As before stated, this may occur as the result of injury, that resulting from the use of a badly-fitting saddle being in all probability the most prolific cause of the condition; riding a horse two or three hundred yards with a badly-fitting saddle is often found to be quite sufficient to produce a well-marked case. The same saddle will not fit every horse, as horses are as different in shape and conformation as men, some horses being possessed of high and thin withers, whilst others have low and thick withers, thickly clad with muscular tissue. After pus is formed it may burrow down even to the scapula, and in some cases extend down behind the scapula. It reaches the suppurative stage sooner than poll evil.

Symptoms.—There is more or less swelling of the parts, accompanied by heat, and there is tenderness on pressure, the animal showing a decided objection to having the parts handled. The presence of pus is manifested by the usual symptoms, as fluctuation, looseness of the hair, etc.

Treatment.—If the case be treated in the early stages, before the formation of pus, the inflammatory action may occasionally be arrested by the application of refrigerants, etc., but when the swelling is great, the parts hot and tender, and it is evident that pus has formed, the parts should be poulticed for a day or two, shaved, and opened freely with the knife, after which the free use of poultices and fomentations should be continued, when, if not too far gone, and the bones are not involved, a cure will usually result. If the case is of long standing and pipes or sinuses have formed, they should be freely laid open and given a dependent orifice. If the sinus is external to the scapula, a permanent opening may be made by means of a seton. If the diseased structures are all external to the scapula and the bones are not affected, the treatment is comparatively a simple matter; but if situated behind the scapula, it may be necessary to trephine this bone, particularly if the spinous processes of the dorsal vertebræ or the cartilage of prolongation are involved. Sometimes the old method of 'coring out' with a small quantity of corrosive sublimate, wrapped up in tissue paper, is very successful; but the knife is the sheet-anchor in the treatment of fistulous withers, and should be used freely to lay the diseased structures open to the bottom. If the bones are affected by caries, they are to be well scraped with the bone-spoon. If any portions of the bone are necrosed, it may be necessary to use the bone-forceps to remove the diseased structures. Any detached pieces of bone should be removed, after which it is to be treated as an ordinary wound. A change of dressing is often beneficial, and an occasional use of astringent or caustic may be necessary. Solutions of chinosol, chloride of zinc, perchloride of mercury, carbolic acid, or creolin, make good injections.

Sprain of the Longissimus Dorsi.—Sometimes this muscle is put to a severe strain, in consequence of which slight swellings may be observed over the loins, and soreness is evinced by the animal when the parts are handled. This condition is oftenest seen in racehorses and hunters, or in any horse habitually put to severe exertion. It is the cause of many a horse being unable to run a good race for months after having run one severe race when out of condition.

Treatment.—The animal should be allowed to rest as long as necessary; that is, until complete recovery is brought about, and either stimulant or anodyne liniment should be applied to the parts. Either hot or cold applications will be found beneficial, and in some cases a slight vesicant may afterwards be required to effect a complete cure.

Wounds of the Groin. — Wounds here are usually of the variety known as punctured wounds, and may be produced in a variety of ways.

Treatment.—If the hæmorrhage be excessive, the first thing to be done is to check it. After which make a gentle but thorough investigation, for the purpose of finding out, if possible, what kind of an instrument produced the wound; and if any foreign bodies be embedded in the tissues they are to be removed, after which the wound is to be thoroughly cleansed, and fomentations, poultices, etc., freely used. When any untoward results are apprehended, a laxative may be given, after which, in the event of erysipelatous swelling, a few doses of sodium hyposulphite or quinine will be found of great service in checking it. It is good practice in some cases, if the animal is plethoric and strong, to make a pretty free abstraction of blood, and if any sign of erysipelas appears, keep up fomentations and use antiseptics very freely. When suppuration occurs here it is diffuse, and may burrow among the fascia and muscles. When pus is formed allow it to escape; this is essential to recovery. Every crevice of the wound must, as far as possible, be thoroughly syringed with antiseptic solution, such as that of carbolic, chinosol, corrosive sublimate, creolin, etc.

ABDOMINAL WOUNDS

Abdominal wounds may be caused in many ways, as by jumping fences, being gored by a bull, jumping or falling on a stake, etc. They are not generally attended by bad results, unless they completely penetrate the abdominal wall.

Treatment.—If the wound is dirty it should be thoroughly cleansed, the hæmorrhage, if excessive, being attended to first. Any foreign body should be removed, after which the interior and edges of the wound should be shaved carefully, cleansed with antiseptic solution, and brought together by means of sutures. If the wound has penetrated nearly through the wall there is danger of the weakened structures giving way. This danger may be obviated by applying a roller bandage, which will afford adequate support to the weakened wall. In cases where the wound extends completely through the abdominal wall, the bowels may protrude several inches or several feet, but if they are found to be uninjured, they may be carefully replaced after undergoing a thorough but gentle cleansing with tepid antiseptic solution, in cases where they have become dirty by touching extraneous bodies. After the bowels have been returned the edges of the wound are to be brought together and secured by means of interrupted sutures, which should be supported by the application of a broad suspensory bandage;* the sutures must be carefully sterilized before insertion either by boiling or soaking for some time in strong antiseptic solution. If the pulse does not become thready the chance of recovery may be considered as good, although it is a very serious injury. On receiving an injury of this kind the horse, in a large majority of cases, immediately assumes the recumbent position. On being called in to such a case, if the patient is lying down, he should, if possible, be at once secured and not allowed to rise, as it is necessary to have him down while closing the wound, etc., and if cast the bowels may suffer injury. If possible an opiate or an anæsthetic should be administered. In case he will not lie down there is no choice but to cast him. The untoward result to be apprehended is peritonitis, which if it occurs, is to be treated in the usual way. The external wound must be dressed frequently if suppuration takes place, and antiseptics used very carefully and thoroughly each time. If the bowels are badly lacerated, as a rule the best plan is to destroy the patient. Small lacerations may be sewn up by sutures of Lembert's pattern. The bowels should be kept in as complete a state of rest as possible; if constipation is present, it may in most cases be effectually relieved by enemas of tepid water, purgatives of any and all kinds being totally inadmissible. The diet should be light in quantity and nature, and of an easily digestible and laxative character. Any untoward symptoms (peritonitis, colic, septicæmia, etc.) which may arise are to be combated according to the indications.

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* In the horse a surcingle, applied over clean dressings, answers admirably.

Abscesses. — Abscesses occasionally occur in the abdominal region, and arise from the same causes as when occurring in other parts, as bruises, etc., and sometimes regular strangles manifests itself in this region by their formation of one or more abscesses.

Treatment.—Open up as in any other part, and allow the pus to escape. Care must be observed, as rupture may exist in connection with the abscess, or a bowel may be cut and cause death.

BURNS AND SCALDS

These may be slight, so as to cause only a slightly reddened condition of the skin, or may be so severe as to cause well-marked constitutional disturbance, great irritative fever, and death from pain and exhaustion. In the former case, where a reddened condition of the skin is produced, the deeper structures being left intact, the pain and irritation soon subside; this is followed by desquamation of the epidermis, and the parts become restored to their normal condition. The effect of a burn slightly more severe than that just described is to cause vesication, or a separation of the superficial from the deeper layer of the skin, the intervening space being filled with a serous exudation. A burn of the third degree of severity is that in which the integument, or rather the injured portion of it, undergoes complete destruction. The fourth and most severe form of burn is that in which the skin, and the tissues beneath the skin, suffer destruction, and the circulation of the part ceases. This description of burn, when extensive, which it usually is, often causes death.

Symptoms.—If the burn be very severe there are usually well-marked rigors, followed by great depression; the patient shows signs of being in great pain, etc.

Treatment.—As soon as possible after the burn has been received the air should be rigidly excluded. Several plans are recommended by which the air may be excluded from the injured parts; probably the best of all being an application of carron-oil, which is composed of equal parts of lime water and linseed oil. It is called carron-oil because it was used first at the Carron Iron Works in Scotland, where people frequently suffered from burns; its use was attended with better effect than that of any other application, and finally became general. If there is much depression, stimulants should be administered; and if the animal shows signs of much pain, the use of opiates internally, and sedative or anodyne applications—as Goulard's solution of lead, opium, etc.—externally, will be of benefit.* Large sloughs may occur, particularly if the burn be in connection with the muscles of the haunch, and yet a pretty good recovery may result. Where stables burn down, and the flame has been inhaled, it almost invariably results in death.

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* Of other remedies, solution of picric acid (recently discovered by a French chemist who burnt his hands severely with sealing-wax), or Liquor Iodi. painted on with a brush and afterwards dusted over with starch, are excellent. The latter in particular is valuable, because as a general rule only one dressing is required, the dark navy blue scab which forms being left undisturbed until the wound has healed, when it comes off by itself.

INJURIES, Etc., IN THE SCAPULAR REGION—SHOULDER-SLIP

'Shoulder-slip' is the name used by professional men, by quacks the condition is usually termed 'sweeney.' The external muscles lose their contractile power, and the opposing muscles on the inner side contract forcibly, in consequence of which a bulging of the shoulder occurs, giving it the appearance of being out of place; hence the name 'shoulder-slip.'

Pathology.—Injury occurring to some part of the limb, inflammatory action, more or less severe, results, and atrophy of the muscles of the shoulder follows in due course of time, either as the result of some interference with the nutrition of the part—which is usually the case where the injury is in connection with the shoulder—or as a result of functional inactivity, as in long-standing cases of navicular arthritis, when atrophy of the scapular muscles may occur in consequence of not receiving a proper amount of exercise.

Causes.—Shoulder-slip may be caused in a large variety of ways, hence it is a condition rather frequently met with. It may be produced by direct or indirect injury. It is most commonly seen in young horses, when the muscles are soft, and consequently more susceptible to injury than those of a mature horse, and more especially when such horses are from the country. It may result from putting a horse to work too soon. Ploughing is a very prolific cause, where the animal walks with one foot in the furrow and one foot out; in such a case probably it is due to the irregular action.

Sudden jerks, such as might be caused by a plough striking a root, or snag, or suddenly starting a heavy load, a badly-fitting collar, jolts or jars, bruises, concussion, or any injury to the shoulder, etc., all tend to produce the condition known as shoulder-slip; and, as before stated, it may occur in consequence of functional inactivity, this form being seen in connection with chronic lameness and injuries situated below the shoulder, as navicular arthritis, carpitis, etc.

Symptoms.—In some cases the presence of inflammation may be detected before the muscles have wasted; but, as a rule, atrophy is the first symptom to present itself to the notice of the owner, and the patient may be somewhat stiff, or even lame, for a few days; sometimes a slight stiffness may exist for three or four days, after which it disappears, and atrophy takes place. There is also an unnatural bulging of the shoulder, as before mentioned. This bulging is well marked and easily seen. In some cases atrophy occurs to such a degree that one might think the muscles had completely disappeared, the antea and postea spinatus fossæ being plainly brought into view, and apparently being covered only with skin. The muscles most severely involved are the antea spinatus, postea spinatus, and teres externus, in the order named, with sometimes the flexor brachii.

Treatment.—Occasionally the muscles are affected at their insertions or tendinous portions; such cases are always difficult, and often impossible, to cure. But in a large majority of cases the injury occurs in connection with the belly or fleshy portion of the muscle, and usually admits of cure. In a case where an animal has received an injury affecting some of the muscles of the shoulder, there may be slight swelling, pain, stiffness, etc. At this stage the patient should be allowed to rest, and hot or cold applications, according to discretion, should be freely used for an hour or two at each application. After the inflammatory action has subsided, a good stimulating liniment, as the ordinary camphorated liniment, may be used. When atrophy occurs, place the patient in a loose-box and give complete rest during treatment. A mild, stimulating liniment may now be freely and frequently used; or, what is still better, a vesicant may be applied to the parts, and repeated as often as may seem necessary. Massage with the hand is also of use. Setons are of great value in the treatment of shoulder-slip, and two or three are generally required, and at least one should be inserted over each fossa. There is no necessity for caustics, firing-irons, etc. In cases that recover, it will take from six weeks to four or five months before the muscular fibre is reproduced. The animal should be kept quiet for three to four months, if necessary; and when the muscle begins to reappear (as it sometimes does in five or six weeks), give light exercise, as in a buggy or other light vehicle. A mode of deception commonly practised for the purpose of selling an animal having shoulder-slip, is to make an opening and blow air into the areolar tissue, which causes the skin to puff out and the shoulder to appear normal, giving it a full, healthy, and natural appearance. As a rule, an animal with a shoulder-slip will do very well for light work, as that of pulling a light spring waggon or a carriage; but should be worked with a breast strap. Frequently, where the bulging of the shoulder is considerable, there exists in connection with it well-marked shoulder-joint disease. Shoulder-slip constitutes an unsoundness.

SEROUS ABSCESSES AND FIBROUS TUMOURS OF THE SHOULDER

These enlargements are frequently met with in front of the scapula, and of course interfere with the usefulness of an animal to a certain extent. They usually occur as a result of direct injury, often from the collar. Inflammation is set up, an abundant exudate takes place, and a fully developed serous abscess is the result. Sometimes they are situated just beneath the skin. Again, they may be more deeply placed. In some cases they have very thick walls, and contain pus, or they may become fully organized, constituting a fibrous growth.*

Symptoms.—The presence of a serous abscess does not usually cause much inconvenience, unless situated in certain parts. As a rule, it is not very sore, and the animal does not seem to object very much to having it handled. There may be fluctuation of the part on being manipulated. There is usually some enlargement also. There is not much heat, if any, and the parts are not tense and shining externally, as in the case in an abscess containing pus.

Treatment.—If any irritation is present, fomentations and poultices are to be employed freely, and after the irritation is reduced the abscess should be freely opened and the contents allowed to escape. They are very troublesome, as they have a tendency to form again and again by virtue of a secreting power acquired by the lining walls of the abscess. The opening should be made at the most dependent part of the abscess, and after having evacuated the cavity it is good practice to keep it open by means of a 'tent' saturated with some mild stimulant such as tincture of iodine or turpentine and oil, or caustics may be injected into the cavity, the object being to destroy the secretory powers of the internal wall of the cavity, after which the wound quickly heals. Pressure, where it can be applied so as to bring the internal walls of the abscess into contact, is often found to be of considerable benefit in conjunction with the other treatment. Setons are sometimes passed right through the growth ; they keep up considerable irritation, induce the suppurative process, and at the same time allow of free drainage. In some cases, however, the practitioner will be compelled to slit the skin and cut the whole of the abscess out, after which it is to be treated as an ordinary wound by antiseptic applications. It will soon heal up by granulation. This is in all probability the best of all ways to treat serous abscesses where they have a tendency to return. If the animal is at all debilitated, constitutional remedies may be administered, as the case indicates. Sometimes it is very difficult, or even impossible to tell whether it is an abscess or a fibrous growth without exploring, which may be done with an exploring needle. When desirous of ascertaining the nature of the contents, an exploring needle is to be passed into the part, which, if an abscess, may be known by the needle, on penetrating the walls, meeting with no further resistance, and on being withdrawn pus or serum, as the case may be, escapes. An abscess may have walls several inches in thickness. If it is a solid growth, on being reached it will offer a considerable amount of resistance to the passage of the needle, which, when withdrawn, shows no sign of having encountered either pus or serum.

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* It is now known that many of these inflammatory growths are the result of the presence of, and irritation by, small parasites, the discomyces.

Fibrous growths are to be moved by means of the knife, and the wound allowed to heal in the ordinary way. In the scapular region we also meet with enlargements, the symptoms of which are as follows : the enlargement may have been present for eight or ten days. It is hot and very tender, the animal evincing considerable pain when it is pressed upon. The hair over the part is found to be loose, pulling out readily. Fluctuation may or may not be detected.

Treatment.—Open up freely, foment, and dress with antiseptics. It is astonishing how long pus will remain in a part without any sign of its presence being manifested. If due to the discomyces give Pot. Iodid., or a mixture of Hydrarg. Biniodid. and Pot. Iodid., in solution in full doses twice a day until the growth has entirely disappeared. Sometimes this alone is sufficient without surgical interference.

Tumours.—True tumours are by no means uncommon in the shoulder region. Fibromas and papillomas are the most common, whilst melanomas or melanotic sarcomas are met with chiefly in gray horses. They give serious trouble if happening to occur just where the collar passes, as they are apt to ulcerate and cause great pain.

Treatment.—The best and surest way is to effect their removal by means of the knife.

SHOULDER-JOINT DISLOCATION

The bones forming the shoulder-joint are held in place by the large and powerful muscles of the region, and not by ligaments. From this one might think that dislocation of the shoulder-joint might very readily occur, and would be common. Such, however, is not the case, dislocation of the shoulder being an extremely rare occurrence in the horse, although very common in man. When it does take place it may be known by the limb being shorter than its fellow, and by the unnatural bulging of the parts.

Treatment.—This is often troublesome if the dislocation has been done some time. Cast the animal, chloroform to ease pain, and relax the tissues, apply strong and steady traction (with pulley blocks if possible) by means of a rope fixed on the lower extremity of the leg, at the same time applying pressure to the joint itself in the proper direction. Afterwards give rest, sling, blister, or apply a 'charge' at discretion.

SHOULDER-JOINT ARTHRITIS

The shoulder-joint is liable to injury in various ways, but is not by any means a common seat of lameness, although commonly supposed to be by a certain class of practitioners, who, when they cannot clearly locate a case of lameness, without the slightest hesitation refer it to the shoulder-joint at once, and blister and seton in the region of the shoulder, putting the poor animal to an endless amount of torture, when in all probability the case is one of confirmed navicular arthritis.

Pathology.—As a result of an injury received in some way, inflammatory action becomes established in connection with the joint. If the inflammation is not checked, but is aggravated or allowed to run on, material is thrown out which consolidates, and the animal is thereby rendered permanently lame. Or it may go a step further, causing caries, partial or complete ankylosis, etc. The tendon of the flexor brachii becoming inflamed gives rise to lameness, which is generally, but, of course, erroneously, called shoulder-joint arthritis by men incapable of distinguishing between the two.

Causes.—The causes of shoulder-joint arthritis are various. It may be caused by direct injury, as by an animal running away, falling down, slipping, etc., and in young horses a very common cause is turning and circling them violently when breaking them to work. It is probably most common amongst cavalry horses, on account of the various evolutions they are made to take, stopping suddenly, etc.

Symptoms.—It is often a matter of considerable difficulty to distinguish between shoulder-joint and foot lameness, especially where the lameness is slight and not well marked; but where this form of lameness is well marked, it is observed that there is difficulty in extending the limb. The animal does not flex the knee to any great extent, and in travelling the limb is kept as straight as possible, and is brought forward with a rotatory motion, swinging it outward instead of carrying it forward in a natural manner. When the animal stands at rest, the foot of the affected limb is held on a line with, or perhaps a little behind, that of the sound limb, with the toe resting upon the ground and the knee slightly flexed. In some cases, swelling, heat, etc., may be detected in the region of the shoulder-joint. On flexing and manipulating the shoulder-joint, pain will be augmented and readily manifested by the patient. On extending the limb, the animal will rear. The parts should be both extended and flexed, and the animal trotted out immediately afterwards, when usually it will be seen that the lameness is increased. On the animal becoming warmed the lameness decreases; but on allowing him to stand all night after good warming exercise, he is found in the morning to be wonderfully stiff and lame. The action is of greater assistance (in diagnosis) than manipulation. He shows a strong tendency to strike the toe and stumble during progression, and on being made to step over an elevation of a foot or eighteen inches, he either refuses, or, being forced, does so with every manifestation of pain and reluctance, to such an extent in some cases as to even cause the animal to groan, and, lifting the affected limb very carefully, he drags it over or strikes his toe against the obstruction.

Treatment.—See below.

SPRAIN OF THE FLEXOR BRACHII

This gives rise to a lameness which is frequently mistaken for shoulder-joint lameness. If inflammation occurring in this muscle be not checked, ossification of a portion or even the whole of the muscle may take place. This is on account of its structure being largely fibrous. If ossification of this muscle takes place, it renders the animal permanently lame.

Treatment.—The treatment for sprain of the flexor brachii is about the same as for shoulder-joint lameness, that is, frequently applied and long-continued fomentations, and sedative lotions to allay irritation, after which cold water or counter-irritants are to be freely used. A cantharides blister or a couple of setons smeared with this agent often act effectually. Anodyne and stimulating embrocations are sometimes of great benefit. Where improvement is perceptible, every chance should be given the animal, and he should not be worked until a permanent cure is effected, or ossification of the flexor brachii will be likely to occur. In the case of an old or cheap animal, where there is a bony deposit around the articulation, destruction should be advised; if a good breeding animal, its life may be preserved.

INJURIES, Etc., IN THE PECTORAL REGION

Injuries of various kinds in connection with the pectoral region are not uncommon, and occur in many ways. Sprain of the pectoral muscles occasionally occurs as a result of slipping, violent muscular contractions, etc.

Symptoms.—There is usually an amount of swelling, in proportion to the severity of the injury received. Pain is manifested by the animal, and there is difficulty in extending the limb.

Treatment.—The treatment consists of rest, long-continued fomentations and cold applications to reduce irritation, after which, if necessary, counter-irritants may be employed.

Growths and Abscesses are sometimes met with in the pectoral region, usually resulting from the rubbing of the martingale, etc. The treatment is the same as that employed for these abnormalities in any other part (see p. 254).

Abrasions may also occur here from rubbing of the martingale, and in various other ways, and when the skin becomes considerably irritated, it is frequently difficult to heal. Use astringent or sedative applications, powder, lotion, or ointments at discretion. Preparations of zinc, lead, or alum are most valuable.

Dropsical swellings are occasionally met with, occurring in the pectoral region usually as a symptom of some constitutional trouble. In such a case treatment would, of course, be constitutional, and not local.

Wounds often occur in connection with the pectoral region. They are usually of the punctured variety, and frequently of considerable magnitude; but even though the wound be large and deep, and appears to be very severe, etc., if no important bloodvessels are injured, the chances are that recovery will take place in a short time.

Treatment.—First check any excessive hæmorrhage, if possible, by means of a ligature, or the torsion forceps. In case the bleeding vessel cannot be secured, recourse must be had to plugging, or filling up the cavity of the wound to check the hæmorrhage. In a majority of cases the hæmorrhage may be effectually arrested by inserting, and allowing the plug to remain within the cavity of the wound for a period of twenty-four hours, or, if necessary, longer, to guard against further hæmorrhage. The plug should consist of tow, cotton-wool, or some similar material, and it may be necessary in some cases to saturate it thoroughly with some styptic, such as Monsel's solution, or solution (or tincture) of the perchloride of iron, before inserting. After all danger of a secondary hæmorrhage is past, the plug may be carefully removed, and the wound thoroughly cleansed by syringing with tepid water; any foreign body that may be in the wound should be now removed, if it had not been removed at first. The search for foreign bodies should be careful and thorough. It is astonishing how foreign bodies will become embedded in the tissues, and remain for weeks, and even months in some cases, and that, too, without their presence being suspected in a great many cases. They have at the Ontario Veterinary College a stick, about ten inches in length by an inch in thickess, which was embedded in the pectoral muscles of a horse for six weeks without its presence ever being suspected. They also have another piece of wood, three inches in length by half an inch in thickness, which was embedded in the pectoral muscles of a colt for a period of three months. So the practitioner should be very careful to remove all foreign bodies that may be present in a wound, as, although the wound may heal, it will most certainly break out again at some future time; and when a wound heals and repeatedly breaks out, it should be a fact significant enough to cause the practitioner to suspect the presence of some foreign body in the part. It may be necessary in some cases to use the knife to make a dependent opening to allow the pus to discharge freely, and if the bone is roughened it may have to be curetted.

Caput Muscles.—Atrophy of the caput muscles sometimes occurs as a result of injury by falling, slipping, etc. When a sprain of these muscles has just taken place, it is often a matter of great difficulty to state positively whether it is a muscular injury or fracture of the bone. Where it is suspected that injury has occurred in connection with the insertion of the muscle, and the animal cannot bear weight upon the limb, it is good practice to place him in slings and use fomentations freely to allay irritation. If atrophy follows, the waste becomes so great as to be readily perceptible, and the animal has more or less difficulty in progressing.

Treatment.—The treatment consists of counter-irritation, by liniments, vesicants, or setons.

INJURIES, Etc., IN THE REGION OF THE ELBOW —ELBOW-JOINT LAMENESS

Elbow-joint lameness occasionally occurs, and is caused in various ways, as by inflammation of the joint, injuries, rheumatism, rupture or sprain of muscles or ligaments, etc.

This lameness is manifested in many cases by symptoms which, to say the least, are extremely puzzling. In severe cases, when the animal is standing quietly, he flexes the limb. He also sometimes extends the foot, but as a rule the foot is not extended. The lameness is usually well marked, and pretty severe. When the animal walks, it is upon the toe, and with a peculiar doubling action, or knuckling of the fetlock-joint. On examining the region of the elbow, heat, pain, and swelling may be detected, and on manipulation of the parts, and flexion of the joint, the pain and lameness are increased. The elbow descends to a level below that of its fellow, and, if the ligaments are sprained or ruptured, it is turned out to a certain extent.

Treatment.—Fomentations are to be freely used to reduce the irritation, after which counter-irritants may be employed beneficially; setons in this trouble being the best form of counter-irritant to use, being preferable to vesicants, as the latter, when applied to the inner aspect of the joint, are likely to set up an irritation which is very hard to allay. The application of a high-heeled shoe is often productive of considerable benefit. The animal should also be allowed to rest until fully recovered.

CAPPED ELBOW

Capped elbow, or shoe boil, as it is often called, consists of an enlargement on the point of the olecranon, due to injury of some kind. Capped elbow is a very common condition. It varies considerably in character, size, etc.

Symptoms.—At first there is only a slight irritation, giving rise to a slight exudate, causing more or less enlargement. In other cases there is considerable inflammation, which terminates in an effusion of serum. In more aggravated cases the effused fluid solidifies and forms a fibrous tumour on the point of the elbow, and in some cases suppuration may take place.

Causes.—The most common cause of this condition is the elbow coming into contact with the shoe when the animal is lying down, and even sometimes when the animal has no shoes on, the condition may be produced by contact of the elbow with the hoof or the ground. Capped elbow may also be produced by the belly-band rubbing the elbow, as it is likely to do when the animal is going down hill. The little parasites, known as discomyces, are frequently the origin of inflammatory growths on the elbow. It is not a serious condition, but is often troublesome, and interferes to a considerable extent with the appearance of an animal. There is always a bursa situated where a tendon passes over a bone, or wherever there is a prominence. This bursa, from long-continued irritation, enlarges as before described.

Treatment.—The treatment of capped elbow varies to a considerable extent. If the injury is of recent date, and the bursa but little enlarged, with only a slight exudate, remove the shoe, foment, and apply lead or refrigerant lotions; and if the animal be in a gross condition a few doses of alterative medicine will be of benefit. If a considerable amount of effusion has taken place, the parts are to be opened freely and the fluid allowed to escape. In some cases lymph and fibre, or shreds, may be observed. Insert a plug of antiseptic tow to keep the edges of the wound open, and syringe or clean out frequently with antiseptic lotions. The exciting cause should be removed. Where a horse is in the habit of injuring the elbow in the manner described, it becomes necessary to afford some protection to the part; this may be effectually done by the application of an elbow-boot at night. It may be removed in the morning, unless the animal is in the habit of lying down through the day. If the enlargement is of long standing, and of a fibrous nature, it should be carefully dissected out.* In such a case the wound heals by granulation, and occupies considerable time in the process. This is due in a great measure to the part being one of extensive motion, not very vascular, and also that irritation is caused when the animal lies down. Capped elbow rarely interferes with the action of the animal, yet is unsightly, and depreciates his value.

Wounds of the Elbow—Emphysema.—The region of the elbow occasionally suffers from wounds of various kinds, as kicks, punctures, open joint, etc., each of which gives rise to symptoms more or less severe, according to its nature. For general treatment see 'Wounds.' A very peculiar and interesting condition is that arising, sometimes, from the reception of a wound penetrating the common integument in front of the shoulder, or between the elbow and shoulder, such as might be caused by an animal staking itself. The injury may be very slight, so slight in fact as to escape notice, but on walking, or travelling in any way, the air passes in through the wound by a sort of pumping motion, gaining access to the areolar tissue, and causes the neck and body to puff up, the swelling in some cases being enormous, and, if the animal be kept travelling, often increases to such an extent as to seriously endanger life by suffocation. Such a swelling may easily be distinguished from that arising from inflammation, etc., by its greater elasticity, and from the fact that it gives out a crackling sound on passing the hand over it. I have observed a similar condition in the ox, produced by the entrance of air through a small open wound in the dew-lap.

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* Sometimes when the inflammatory growth is due to the discomyces it is impossible to dissect every bit away. In these cases the patient should be dosed with Pot. Iodid. (or Hydrarg. Biniod. and Pot. Iodid.) regularly for some weeks afterwards.

Treatment.—Immediately on discovering such a wound, it should be closed by means of sutures, and the animal kept quiet for a day or two, until the healing process has sufficiently advanced to prevent the entrance of air into the areolar tissue. In cases where the presence of the wound has escaped notice, and the animal exercised until the swelling of the neck and body previously described takes place, the animal should be kept perfectly quiet, and if the swelling is not excessive it will not be necessary to resort to any active measures to remove it; simply allow the animal to stand quietly, and the air contained within the areolar tissue will be removed by absorption in twenty-four hours or so. Its removal may be hastened by the use of fomentations, and the application of slight pressure to the parts. In certain parts it is by no means bad practice to make a few incisions to favour the escape of the air, and such a procedure becomes absolutely necessary in such cases as present very urgent symptoms, that is, in cases where the swelling extends, involves the head and lips, and danger of death from suffocation becomes imminent. In these cases tracheotomy may have to be performed.

INJURIES TO MUSCLES AND TENDONS IMMEDIATELY BELOW THE ELBOW

Wounds of various kinds in connection with the muscles below the elbow are by no means uncommon, but, as a rule, if the animal is kept quiet, hot or cold applications used, and the various remedial measures adapted to each case employed, recovery takes place ; however, if the animal, as is often the case, be put to work, or is exercised, inflammatory action becomes increased, often terminating in suppuration of a diffuse character, and the pus may burrow down among the tendons and ligaments and produce the most serious results.

Symptoms.—The symptoms of diffuse suppuration are pain, and often swelling ; the animal backs and walks with difficulty. The parts, on handling, are found to be hot and tender, and sometimes fluctuation may be detected.

Treatment.—The treatment, or proper course to pursue, is plainly indicated, but is not always a very easy matter. An incision should be made longitudinally, and sometimes transversely as well, with Symes' abscess-lancet, and the pus allowed to escape. After-treatment as usual. Sometimes there may be sloughing to such an extent as to produce open joint.

Sprain of the bellies of the muscles sometimes occurs in consequence of slipping, muscular contraction, etc.

Symptoms.—The animal has more or less difficulty in flexing and extending the limb. If a flexor alone is sprained, difficulty is shown in flexing the limb, and extension of the limb is performed with difficulty when the affected muscle is an extensor. There may or may not be pain on pressure, but there is usually more or less swelling.

Treatment.—Give the patient rest, and use hot fomentations and refrigerant lotions to allay irritation, after which a mild stimulating liniment or blister will often be of great service. The condition, generally speaking, is not at all serious.

Bursal Enlargements.—Bursal enlargements occasionally are seen in connection with, or just above, the knee, and in front of the fetlock-joint, and are usually caused by injury, as blows, wearing a yoke, etc.

Symptoms.—There is at first more or less swelling, which extends upward and downward for a short distance. After a certain length of time the swelling disappears, and nothing but a little puffy tumour remains. It cannot be considered as much of a detriment to work in a large majority of cases, but it is unsightly in appearance.

Treatment.—The exciting cause, if recognised, must be removed, and the animal allowed to rest. Cold and astringent applications are to be freely used, in conjunction with two or three hours' pressure every day, rubber bandages properly applied being of great benefit. A mild stimulating liniment may also be used, and finally Hydrarg. Biniod. may be applied as a counter-irritant, and in certain cases it may be advisable to open the bursa ; but in doing so the utmost care must be observed, or serious results may follow. After opening the bursa, it is to be kept open for a day or two by means of a 'tent' saturated with antiseptic lotion. Opening the bursa, however, is not always to be recommended, and should only be done as a last resort. It must be done under the strictest antiseptic precautions.

Tendinous Injuries.—Laceration of the fibres of a tendon sometimes occurs in consequence of injuries received while running away, etc., and in some cases the tendon may be completely severed. When it is, the patient must be placed in slings and kept quiet, and the limb kept straight by splints or bandages (this latter point is one of great importance, as, if the limb is not kept straight, a good cure can never be made).* After a time an exudate will be thrown out, and reunion of the divided ends of the tendon takes place. When the tendon is partially divided, and is neglected, it often swells to a considerable extent, and may become completely severed. When the animal moves, the tendon may be seen moving up and down, and generally there is to be seen a fungoid growth in connection with its ends. This growth must be removed, either with the knife or by means of caustics. Caustics should, however, not be used except when absolutely necessary, and, when used, should be employed in a very careful manner, so as to prevent injury to the surrounding tissues. After the divided ends of the tendon have reunited, there usually remains more or less of an enlargement, which is, however, in many cases so slight as to be scarcely noticeable, and as a rule it causes no inconvenience.

CARPITIS

The carpal joint is somewhat complicated, and is one of the most wonderful structures in the body. It is by no means a common seat of disease, and not nearly so liable to trouble as might be supposed from its exposed situation; however, inflammation occasionally occurs in connection with it, usually as a result of injury, directly or indirectly inflicted. It may also occur in consequence of a rheumatic tendency both in young and old animals. Concussion also causes carpitis. This disease, though rare amongst old or mature horses doing ordinary work, is not at all uncommon amongst young horses, racehorses, hunters, and pit ponies. It may be caused by galloping on hard ground. The inflammation may involve the whole articulation, or only a small portion of it. When the whole joint is involved, it becomes a serious affair, being liable to produce ankylosis and cause a stiff leg, thus rendering the animal comparatively useless for work.

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* The divided ends, if they can be seen and are not too much lacerated and shortened, should be sutured.

Symptoms.—When the patient is made to walk, there may be observed more or less difficulty in extending the limb; occasionally it is brought forward in a curve, or with a rotary motion, somewhat similar to the action of shoulder lameness, for which carpitis is often mistaken; but the limb is not lifted so high as in shoulder lameness. He does not flex the knee, and may stand on the affected limb pretty firmly, and during progression, on close observation, it may be seen that he steps slightly further with the lame than with the sound limb. In a great many cases swelling and heat may be detected, but in some cases these symptoms are absent. In such a case the lameness is very difficult to diagnose. The lameness is very similar to that of splint, but is usually more severe, and during progression, particularly if trotting, the animal drops excessively. After rest, if a horse has some little irritation of the knee,when brought out of the stable he is not lame, but soon becomes lame on being exercised. If lame in both knees, the animal has a faltering action, called by some people 'chest-founder.' On tapping the knee gently, pain is caused, on flexing it he flinches very much, and on being made to trot immediately afterwards, the lameness is usually increased.

Treatment.—Complete rest is highly essential in the treatment of this, as of other joint diseases. Keep the patient standing quiet, and allay the irritation by the ordinary means, as fomentations, refrigerant and anodyne lotions, etc.; and in some cases, where the irritation is not too great, a starch or plaster bandage, properly applied to the knee, will be of great benefit. After the irritation is allayed, counter-irritants should be applied — counter-irritation being of the most wonderful efficacy in this trouble. Cantharides or biniodide of mercury ointment may be used pretty extensively, and in such a manner as to invest the whole of the joint, not so much, however, being applied on the flexion side of the joint as on the other parts, as a considerable irritation—and one very troublesome to cure—may result in connection with the skin of the part. If properly treated, as above directed, a cure may be expected to result at the end of a period varying from a week to ten or twelve days, if it is an ordinary case of carpitis. Some cases, of course, from the intensity of the inflammation, may take longer, or never be permanently cured.

BROKEN KNEES

Broken Knees.—This term is applied to any scar on the front of the knee-joint, and may mean a mere loss of hair, a superficial wound, or a very serious and deep wound involving the discharge of synovia from the sheath of the extensor metacarpus or extensor pedis tendon, or even from the knee-joint itself. Broken knees are usually caused by a fall on the road, although they may be the result of any injury, such as that from a kick, a knock against the manger, or any hard substance.

Treatment.—Thoroughly cleanse the wound with warm antiseptic solution. Warm poultices are sometimes very valuable to assist in this. Apply antiseptic lotions or dressings on cotton-wool, bandage, and place the animal on the pillar reins, or tie up so that it cannot lie down to bruise them afresh. Give a dose of physic and place on laxative food. In a few days apply cold irrigations if a hose-pipe is at hand. When a scab has formed, leave exposed to the air and give gentle exercise, to prevent tendency to stiffness and ankylosis. With an open joint extra care must be taken; to stop the flow of synovia the wound may be painted with oil of cloves or dressed with alum, iodoform,

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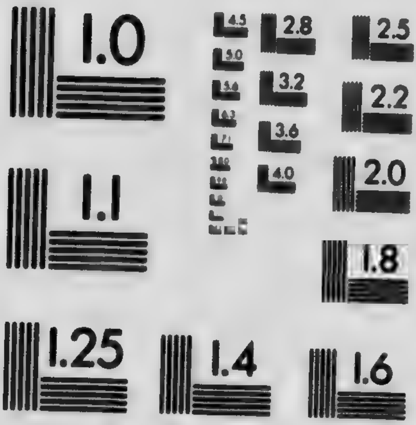

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zinc oxide, and starch. With a mere skin abrasion, ordinary white lotion sponged on several times a day, and cold irrigation from the hose-pipe are all that are necessary. Tetanus, when the wound has almost healed, is a common sequel, as the bacillus of this disease is met with in the dust of roads. Cherry's operation to remove the scars of broken knees has been recently revived by M. Vinsot, a veterinarian in France, and with modern antiseptic surgical procedures is very successful.

Speedy - Cut. — This consists in a contusion or wound immediately under the knee, inflicted by the horse with the shoe of the other foot usually when travelling very fast or when tried beyond its pace. It is often seen amongst trotting horses, and in horses of a certain conformation, as in animals which are 'lady-toed' or run close; and high action is often a cause of speedy-cut, where the latter occurs in connection with the knee. Speedy-cut may be only a contused wound of a very trivial character, or there may be rupture of some of the small vessels; extravasation and coagulation of the blood may take place, and it is often very difficult to remove. In some cases the injury to the bone is followed by an exostosis. Permanent enlargement remains. This not only detracts from the appearance of an animal, but from its size is exposed and likely to suffer from injury on subsequent occasions, the parts receiving many blows which they would otherwise escape.

Treatment.—The first thing to do is to remove the exciting cause, which may be done by proper attention to the feet, shoeing, etc. The animal should be rested while being treated, or if exercised should wear a boot to protect the injured part. If the enlargement is not solidified, fomentations or cold applications may be freely used for the purpose of allaying irritation, if any be present. After the irritation is allayed the enlargement may be opened, but should never be opened until all irritation is allayed, or there will generally be cause to repent it. If the enlargement is solidified, reduce irritation by the usual method, after which counter-irritants may be applied, and usually, in such cases, it will take a long time to effect a cure. In case pus or serum forms, it should always be allowed to escape, and the wound should be treated in the ordinary way, by applying simple dressings, as tepid water, or mild astringents, as Plumbi Acetas in solution, or the ordinary white lotion, made stronger or weaker as the case requires.

INJURIES, ETC., BELOW THE KNEE— SPRAIN OF THE METACARPAL LIGAMENT

The most frequent seat of sprain in this region is the metacarpal ligament, and this constitutes a condition commonly, but improperly, known as 'sprain of the back tendons.'

Causes.—Sprain of the metacarpal ligament may be caused by violent exertion of any kind, as racing, jumping, etc., but may occur in cart-horses pulling heavy loads, and more especially if they are shod with high-toed shoes ; and some animals, on account of faulty conformation, have a tendency to this sprain.

Symptoms.—The lameness may or may not be severe. The presence of an exudate may readily be discovered on examination of the parts. Pressure on the tendon does not elicit from the animal any manifestation of pain, but pressure anterior to the tendon causes considerable pain, which is shown by flinching, etc. If bathed with hot water, temporary relief is obtained. The irritation being removed for a while, the animal stands with the limb slightly flexed. (When the *tendons* are affected, the swelling is found further back, situated about the middle of the tendon ; and frequently the limb is bowed, taking on the shape usually assumed by the dried specimen).

Treatment.—If the case is treated immediately, refrigerant applications are to be freely used (if the weather is warm); sal ammoniac, potassium nitrate, white lotion, etc., are all of great benefit. By these means exudation may be lessened in quantity or almost completely prevented. Ice-water is also very useful, and bandages should be applied. If the exudate has already taken place and there is much pain present, fomentations as hot as the animal can bear are to be freely used. Anodyne applications are also useful here to allay pain, and when all irritation has ceased vesicants should be used, Unguentum Hydrarg. Biniod., or Ung. Cantharidis, applied in the usual way, and of the usual strength, being the best. A vesicant properly and judiciously applied will tend to prevent the organization of the exudate, and when it is already organized will tend to remove it. If used too soon, however, it will do great harm. Firing is not to be recommended, except in certain rare cases, as it usually does more harm than good.

Tendons, Bruise of.—The tendons are occasionally bruised, but not sprained, by the animal striking himself during a gallop, or another horse striking him.

Symptoms.—The pain and lameness are usually very great, the inflammation is superficial to the tendon, and it may be mistaken for a 'break-down.' There is also some swelling, heat, and tenderness.

Treatment.—Endeavour to remove all irritation in the usual way, after which apply a mild stimulating liniment, or slight counter-irritation. In sprain of the metacarpal ligament or the flexor tendons, the animal should be rested for a long time—six months, or a year if necessary—as if he gets sufficient time in which to rest, a complete recovery will take place, and he will be able to do any amount of work afterward as well as ever; but if put to work too soon he may go all right for a while, then break down irreparably.

Contraction of the Tendons.—Contraction of a tendon consists of a shortening of the affected structure, causing the leg to be bowed more or less, in proportion to the amount of contraction that has taken place.

Causes.—Contraction may occur in consequence of any injury to the tendon, as laceration, blows, cuts, etc.

Symptoms.—The symptoms are very plain, and a case once seen insures recognition of all cases subsequently met with. The tendon being shortened causes the animal to stand and walk upon the toe; the leg has a bowed appearance, and the fetlock knuckles over. The region of the flexor tendons usually has a full appearance, and on manipulation is found soft and full to the touch, instead of being fine, thin, and hard, as in the healthy limb. The animal when standing up or during progression has a groggy, uncertain sort of appearance. Sometimes the contraction is so great that the poor animal in walking is compelled to bring the anterior portion of the wall of the hoof to the ground first, the sole not touching the ground at all, and as time progresses the hoof gradually becomes deformed, until finally it becomes so misshapen as to in nowise bear the slightest resemblance to a foot as it ordinarily appears.

Treatment.—If any irritation exists in connection with the [illegible], it should be allayed by the methods usually employed. After the irritation is allayed, counter-irritation in a pretty severe form, if thought necessary, should be employed. The feet should be pared and brought as nearly into their natural shape as possible; and it is good practice in many cases, as in working horses, to apply a moderately high-heeled shoe. In the case of thorough-breds the shoes are to be removed altogether. The above treatment will often succeed in mild cases, or cases subjected to treatment immediately it is observed that contraction of the tendon is going on. In severe or long-standing cases, after all irritation is removed, the condition can only be remedied by the operation of tenotomy. The tendon should be severed with the tenotomy-knife, the adhesions broken down, the limb forcibly straightened, and the animal compelled to move about in his box to prevent recontraction. In congenital contraction the operation is attended with great success.

SPRAIN OF THE SUSPENSORY LIGAMENT

The suspensory ligament keeps the limb in its upright position. Sprain of this ligament is by no means uncommon, and when it takes place the animal should be allowed to rest until perfectly recovered. It is met with amongst all classes of horses, especially those doing fast work or much pulling, and starting with heavy loads on uneven ground. Rest is essential, as if worked as usual the chances are that it will terminate in break-down, and the animal be rendered useless for all but slow work.

Treatment.—The treatment is simple, consisting of plenty of rest and the use of hot fomentations, cooling lotions, and tight supporting bandages. The limb may be bandaged alone with cotton-wool or felt compresses placed on either side to give equable pressure for a time, the bandage being removed and replaced after massage has been applied. Stimulant or anodyne liniments will also be found very useful, and a vesicant may be necessary. After all sign of lameness has disappeared, the animal should be given a considerable rest to allow time for total recovery to take place, and to guard against the danger of a fresh sprain before the tendon has become strong again. A pitch plaster bandage can be left *in situ* for some time if considered advisable. This is frequently done with hunters.

RUPTURE OF THE SUSPENSORY LIGAMENT

'Break-down' consists of rupture of the suspensory ligament. It is just about the bifurcation of the ligament that rupture takes place, and break-down is described as partial and complete, partial being where one branch is ruptured, and complete where both branches forming the bifurcation are ruptured. In this latter form the fetlock-joint descends nearly to, or in some cases reaches the ground. It is a far more serious condition than sprain of the ligament, and in every case where complete break-down takes place it permanently incapacitates the animal for fast work. It is of greatest frequency amongst racehorses, trotters, and horses doing fast work, and more especially where they run on hard tracks, as they do on the American continent. In England, where horses run on the soft and yielding turf, break-downs are comparatively rare. It may also occur in horses drawing a heavy load, and more especially if they are weak-limbed, are shod with high-toed shoes, and are in the habit of slipping, or making false steps, etc.

Symptoms.—The symptoms vary to a considerable degree, in accordance with the extent or nature of the injury. If one of the branches forming the bifurcation be ruptured, partial descent takes place, and the fetlock leans to the side of the ruptured portion of the tendon, being lower on the side formerly supported by the ruptured branch. If the rupture be complete, the fetlock will descend in many cases nearly to the ground. In many instances where the branch of one side only is ruptured, there may be slight lameness, swelling, etc., which disappear on applying cold water, etc., for a day or two. The irritation being allayed, the animal is put back to his former fast work, and comes completely down, the ligament snapping, probably on the first severe gallop he is put to; and when this takes place the limb never regains its former condition, but is always weak. However, it is wonderful the amount of slow work such an animal is capable of doing, and how strong he will become on the limb as time progresses; but it is useless to expect such an animal ever to do fast work again.

Treatment.—A very long rest is essential, and without it all other treatment will avail nothing. The pain should first be allayed by hot fomentations and sedative lotions. Anodyne liniments may also be employed in conjunction with either hot or cold water. After pain and irritation are allayed, apply cold irrigation, tight bandaging, and stimulalating liniments; if this fails, blister or apply the actual cautery and afterwards a smart blister. A Derby bandage will do very well to support, or keep the parts in position, or in some cases a pitch or plaster of Paris bandage may be applied and allowed to remain for a few weeks. It will be found highly serviceable, as it will support and retain the parts in their natural position as long as desired. Afterwards apply counter-irritants, and in this trouble counter-irritation may be applied sooner than in sprain of the metacarpal ligaments. Sometimes the rupture is gradual, such a case may be known by the ligament standing out rather prominently, and feeling somewhat soft; pain is also present in the parts, and there may be slight lameness. Rest in such a case is required for a long time, as if rested for two or three days only, and then put to work, the chances are that complete break-down will result. As a last resort, when the suspensory seems well united again but much thickened, and causing lameness from pressure upon the plantar nerve, median neurectomy may be tried.

It is usually successful in getting rid of the lameness, and, if the animal is of value for breeding or for steady harness work, is well worth doing.

Cut Tendon. — A tendon may be cut or lacerated in various ways. If completely severed the ends must be brought together by sutures or bandages, give perfect rest, elevate the heel, and apply a shoe arranged so as to keep the limb in one position. Apply antiseptics, cold irrigation, and bandage tightly to prevent excessive granulation.

SPRAIN OF THE FETLOCK

In the region of the fetlock we may have inflammation of the joint, sprain of the ligaments, etc.

Causes.—The causes of sprain are many. It may be due to stepping upon a stone or some slight inequality of ground, making a false step, either during a walk or a gallop; and an animal may be more or less predisposed to such an accident on account of bad conformation, etc.

Symptoms.—There is more or less lameness, and a stubbiness in action. Heat, pain, and considerable swelling exist, and may be greater on one side of the joint than on the other. The diagnosis is further helped by flexing the joint, when the animal shows pain, after which, on being trotted out, the lameness is observed to be increased. No harm ever accrues from examining the foot, or even the whole limb. More particularly is this true in the case of the hind limb, as the animal may have picked up a nail, and both in sprain of the fetlock-joint and injuries to the hind-foot there is knuckling of the fetlock-joint.

Treatment.—Hot fomentations and cooling lotions, followed by cold irrigations and stimulating liniments. Prolonged rest is essential if the sprain is severe. Blister and use the actual cautery at discretion. Median neurectomy as a last resort. Ulnar neurectomy after this would *completely* deprive the parts of sensation, but there would be serious risk of ultimate break-down of the tendon.

SESAMOIDITIS

This consists of an inflammation of the sesamoid bursa, in consequence of sprain or the reception of an injury of some kind.

Symptoms.—There is lameness more or less marked, the animal usually going on his toe. There is also more or less swelling of the bursa, and on a careful examination considerable heat may be discovered in connection with the parts. On manipulation pain is evinced by the patient, and after flexion, extension, etc.—the joint being manipulated in various ways—the animal on being trotted out is observed to be lamer than before. The swelling of the bursa is hard and tense, and offers much greater resistance to the fingers than is offered by an ordinary wind-gall. After a few days' rest the animal may go perfectly sound, but quickly becomes lame on being exercised, the lameness, as a rule, being very obstinate in character.

Treatment.—When the case is first brought under observation, if the parts are hot, cold bandages or cold irrigation should be tried for a few days, but, as a rule, the relief is very temporary, and the lameness returns upon work being resumed. Much time is often saved by the use of the firing iron, or, at all events, a smart blister, at once. Perform median neurectomy if everything else fails, and as a last resort follow this up by ulnar neurectomy.

Interfering or Brushing.—A horse is said to 'brush' or 'interfere' when he hits the inside of the fetlock with the hoof or shoe of the opposite foot. Often, in consequence of the application of irritating lotions, hot liniments, etc., inflammation occurs, and the condition becomes one very difficult to treat. In some cases, while the skin may not be broken, the deeper tissue are bruised, causing inflammation and the formation of pus. Occasionally a case is met with, more especially in winter, where the animal stands with the limb slightly flexed, has been lame in a slight degree for some time, but the lameness has become greatly increased, and the animal moves with difficulty. On handling the parts the presence of heat is discovered, and the animal evinces considerable pain. By a careful examination fluctuation may be detected. The swelling is generally on the inside, the injury, usually occurring in the neighbourhood of the fetlock, being inflicted by the foot of the opposite side. In some cases the hair may be readily detached with the fingers, or even falls off of its own accord.

Treatment.—Where the above symptoms are presented, the parts should be opened by means of a lancet, and the pus allowed to escape, after which a poultice may be applied, and antiseptic and weak astringent lotions used until the wound heals. The evacuation of an abscess in this region by means of a lancet must be accomplished with a great deal of care, as an imperfect knowledge of anatomy or an unsteady hand may cause irretrievable damage. The form just described is of most frequent occurrence during winter, the cold weather exerting a prejudicial effect in such cases, as often the bruise, simple in itself, if frostbitten, constitutes a very serious condition. Constitutional symptoms are often presented as anorexia, heightened pulse, etc., in such a case. The contusion in its simple form should be treated at first by hot fomentations, poultices, etc., after which anodyne and astringent lotions will be found useful. Hot or irritating liniments should never be used, and while using the animal the part should be protected by a suitable boot. Shoe with feather-edged (blind-sided or knocked up) shoe, and rasp the opposite hoof down on the inside. Sometimes a shoe made higher on the inside than the outside is effectual. Thickening of the tissues is to be treated with Ungt. Iodi.

OPEN BURSA

Wound of the Bursa of a Tendon is a very serious condition, but is not by any means of as grave a character as open joint.

Causes.—A bursa may be opened in many ways, but is generally opened by direct injury, such as received when falling, by the entrance of the prong of a pitchfork, etc.

Symptoms.—There is an oily discharge like synovia, and sometimes it is difficult to state positively whether it is a bursa or a joint that is opened. If the wound is infected the discharge also becomes purulent; the animal persistently stands. Severe constitutional symptoms, as heightened temperature, increased pulse, anorexia, etc., may be manifested.

Treatment.—If necessary, the animal may be placed in slings. The hair around the wound should be shaved off, and the wound itself thoroughly cleansed and treated with some non-irritating antiseptic, such as chinosol lotion (gr. i. to ℥i.). It should then be dried and dusted with some dry powder, which will coagulate synovia, such, for example, as alum, oxide of zinc, and starch, the scab being allowed to remain undisturbed for some time. A blister is sometimes of service applied around the edges to close the wound. Constitutional disturbances and complications must be treated as they arise.

KNUCKLING OF THE FETLOCK JOINT

Knuckling may be described as an unnatural position of the fetlock-joint, which is more or less flexed, causing a correspondingly large protuberance on the anterior aspect of the joint. It exists as a symptom of disease, and cannot properly be considered as a disease of itself. It often coexists with contraction of the flexor tendons, ringbone, corn, quitter, and other conditions. It is rarely that it can be said to be a serious condition, as an animal may knuckle for years, and after death, on dissecting the joint, no visible sign of disease be present in the articulation. It may be caused by overwork without any actual disease being present. Severe pulling, etc., may cause it, hence it is often seen in young horses when first put to work. If the exciting cause be kept up, it becomes habitual; and where knuckling becomes a habit, it will remain through life. It may occur as a result of sprain of the tendons in order to rest them. It occurs most frequently in connection with the hind limb. Certain conformation of a limb may predispose an animal. It is sometimes a result of debility, etc.

Treatment.—If of long standing, and the usefulness of the animal is not impaired by the knuckling, the best plan is not to interfere with it, because the chances of success are very small, especially if the animal be advanced in years. If knuckling occurs as a symptom of disease, of course the cause, and not the symptom, should be treated. Try to get the animal in good condition. A run at grass in the spring or summer is often very beneficial. Cold and astringent applications are useful, and may be followed by a vesicant.

Dislocation of Fetlock-Joint.—Dislocation of the fetlock-joint is a condition of rare occurrence, but may take place during fast and hard work, falls, etc. The symptoms are very plain, the animal being dead lame, and evidently suffering great pain in connection with the part, which is considerably swollen, etc.

Treatment.—Endeavour to reduce the dislocation under chloroform by traction and pressure. It is very difficult, and even when replaced it is usually still more difficult to keep it there. Blisters or stiff plaster bandages give the only prospect of success. Prognosis must be very guarded.

SPRUNG KNEES

In this condition the knees bend forward, in consequence of contraction of some of the flexor tendons.

Cause.—The condition is usually caused by hard and fast work. Irregular exercise will also produce it, as keeping the animal in a stall for several days, then taking out and driving freely. In other cases it may result in consequence of insufficient exercise and over-feeding; hence it is often seen in colts until turned out on pasture, when it leaves them. It may be caused by a horse standing in a stall with a floor sloping from before backward. Especially do the above causes operate in the production of sprung knees where there is a weak conformation of the parts.

Treatment.—In case it is due to standing on a sloping floor, the animal is to be placed on a level surface, or in a stall lower in front than behind. A mildly stimulating liniment or a slight vesicant is sometimes useful. In an old horse treatment is useless. It is hardly an unsoundness, and often it does not seem to interfere with the usefulness of the animal even in the slightest degree, but it is unsightly.

Calf-knees.—This condition is the opposite one to sprung knees, the knees standing back like those of a calf, hence the name. Such a limb is very weak, and liable to sprains, etc. In some cases the limb may bend backward to such an extent as to cause the flexion side of the joint to project and present an appearance similar to that of the point of the hock.

Treatment.—The condition cannot be remedied by any means known. It is purely a defect of conformation, and a bad fault too.

Inferior Sesamoidean Ligaments.—These ligaments are often sprained, as well as the other ligaments and tendons in the vicinity. It is often a matter of extreme difficulty to correctly diagnose this condition, and mistakes are frequently made.

Causes.—It occurs most commonly in horses doing hard and fast work, hence it is oftenest seen affecting trotters, runners, and hunting horses.

Symptoms.—As before stated, the symptoms are not well marked. On coming out of the stable, the animal steps in a gingerly manner, showing what is usually called tenderness, and there may be a slight swelling and soreness of the part. The joint and all the portion of the limb suspected is to be given a thorough examination by flexing, extending, pressure, and manipulating in every possible way. Upon digital pressure in the region of the heel the patient evinces pain.

Treatment.—In this, as in lameness arising from all other ligamentous affections, absolute rest for some time is imperative, as without it a cure can never be effected. Hot fomentations and swabs with refrigerant lotions should be freely used, being useful to reduce the irritation of the parts, after which counter-irritants are indicated ; but the application of counter-irritants in the region of the heel should be made with great care, as an irritation may be set up which can be allayed only with the greatest difficulty.

Wounds occurring in this region may be well cleansed and treated antiseptically ; but if the tendon is divided, it is advisable to destroy the animal, as in many cases there follows an abnormal growth of horn or hoof; the foot becomes shapeless, and the animal is rendered useless.

WINDGALLS

Windgalls are soft, puffy tumours, situated at the back of the fetlocks. They were formerly supposed to contain air, but now are known to be bursal enlargements in connection with the fetlock-joint, caused by increased secretion of the fluid of the bursæ in connection with the flexor tendons. As a rule, windgalls are not productive of any harm. Occasionally, however, a windgall is found to be hard, hot, and tense, and perhaps associated with lameness. In such a case it is generally connected with some sesamoidean trouble or affection of the joint itself. Such windgalls may also have within them a sort of porcelaineous deposit, and are likely to cause trouble, and an animal having them should be rejected on an examination as to soundness. But windgalls, as they ordinarily occur, readily give way to pressure, are not hot, and are perfectly free from soreness or tenderness, and are not associated with lameness. Such a windgall is not likely to ever produce any bad results, and on an examination as to soundness, their presence and nature may be made known and the animal passed. There are bursal enlargements in connection with the knee, hock, etc., of exactly the same character as windgall of the fetlock-joint. A slight windgall should not depreciate a horse's value to any great extent. They often appear very suddenly.

Causes.—The primary cause of windgalls in most cases is hard and fast work, drawing heavy loads, jumping, or any work in which the limbs are put to a severe test, and they are especially liable to appear if the horse be young and soft. Certain conformation of limb favours the occurrence of windgalls, a horse with straight, upright pasterns being more likely to suffer than a horse with oblique pasterns. Still, it must not be forgotten that while windgalls are more likely to appear in connection with a coarse or badly-formed limb, they are by no means uncommon in limbs otherwise faultless. Take, for instance, a well-formed horse four or five years of age, that has had no work for some time; drive him for a day or two, or drive him twenty or thirty miles in one day; the chances are that the next morning, after the animal has rested, there will be observed a puffiness or fulness in the region of the fetlock, which very likely will disappear in the course of a few hours, only to return in thirty-six or forty-eight hours, when a well-marked case of windgall becomes established.

Treatment.—The treatment of windgall often results in failure. Especially is this the case where they are of long standing. Any little irritation, heat, etc., that may exist should be allayed by the free use of warm or cold applications, according to the season of the year. Hand-rubbing is also of great benefit. The Derby bandage may also be applied. In connection with the bandages, soft compresses will be found of great use, and should be adjusted in such a manner as to press directly upon the enlargements. Cooling and astringent lotions, as white lotion, Sal Ammoniac, or Plumbi Acetas in solution, are also useful, after which the repeated application of vesicants will be found of benefit. Ungt. Iodi is sometimes useful, but only in very stubborn cases. It takes considerable time to reduce a windgall of long standing, and sometimes it cannot be done at all. Laxatives and diuretics may be administered if thought necessary, and are of undoubted benefit in stubborn cases and as auxiliaries to the local treatment. The animal should be placed in a loose-box and fed moderately. The best time to begin the treatment of windgall is in the early part of the winter season. After using pressure, vesicants, etc., the animal should be turned out, the parts being enveloped in plaster bandages, which must be re-adjusted occasionally, and, as a rule, after running out all winter, the horse comes up in the spring with nice clean limbs perfectly free from windgalls; but as soon as the animal is put to hard or fast work they will reappear. In rare cases windgalls may be opened, drained, and pressure applied, or a fluid may be injected, as dilute iodine, after aspirating the bursa of its contents; but, generally speaking, opening a windgall is not attended with much success, as a rule considerable irritation resulting in consequence of the operation, and much trouble caused thereby; and even in cases where any untoward results, as irritation, etc., are escaped, the operation is usually attended with failure.

HIP-JOINT ARTHRITIS AND ULCERATION

The hip-joint is much less frequently the seat of disease than is commonly supposed. Why this should be so is apparent to anyone understanding the structure and situation of the joint, it being one of the strongest joints in the body, being formed of some of the heaviest bones in the body firmly secured in place by extremely powerful ligaments, the principal of which are the ligamentum teres and the pubio-femoral, the latter being absent in the ox. Besides the joint being a powerful structure in itself, it is further protected by masses of powerful muscular tissue, under which it lies deeply buried. Hence it may be considered as a matter of some surprise, not that it is so seldom affected, but that it is so frequently affected. The very circumstances, it may be stated, which so efficiently protect and render this articulation so little liable to disease or injury are those which also render the treatment of disease in this region so extremely difficult, for it must be manifest to everyone that external applications as applied in the treatment of hip-joint troubles can have but little effect upon a structure so deeply placed and so heavily clothed by muscular tissue. Inflammation may occur in this joint, and usually supervenes upon injury of an indirect character, as the localization of rheumatic trouble, or by a false step or slip of the foot the ligamentum teres may be sprained. The ligamentum teres is easily injured, comparatively speaking, as, for instance, the animal may be travelling at a pretty fast gait and place his foot upon a stone, which rolls, or gives way. The weight of the animal's body, and the force of the foot striking the ground, the speed at which the animal is travelling, etc., all combine to cause a fearful strain. The ligamentum teres is injured, and in all probability a valuable animal is in an instant rendered lame for life. A very slight slip made by an animal while drawing a heavy load may be followed by the same result. Any exercise of a very violent character, as jumping, sudden turns while running, slipping, falling, etc., may all be said to occasionally operate as causes of hip-joint lameness. When inflammation occurs in this joint a series of pathological changes are observed to take place in exactly the same manner as in other join[illegible]st there is redness of the synovial membrane, an exudation is thrown out, and, as the disease progresses, ulceration of the articular cartilage and laminal layer of the bones occur. The integrity of the joint is lost, and partial ankylosis may occur. In disease arising from the localization of rheumatic trouble there is a strong tendency to the deposition of porcelaineous material.

Symptoms.—If the inflammation existing in the hip-joint be violent, symptoms correspondingly severe are manifested by the animal, which stands persistently, being very averse to walking, or moving about in any way. The foot is elevated from the ground, and not allowed to descend, unless the animal be forced to move. On moving about or placing any weight upon the affected structure it is easily seen that the animal suffers pain of the most excruciating character, and the pain is increased in proportion to the amount of movement the animal is compelled to perform. Pain of such a severe character is naturally accompanied by pyrexia, well marked; anorexia, which is sometimes partial, but usually complete, followed by great emaciation, and atrophy of the muscular tissue in the region of the affected part; and in many cases the animal becomes unable to lie down, or does so only with the greatest difficulty. If the violent symptoms above described do not soon abate, or some signs of improvement be made manifest, the fact should be received as an indication that the various changes previously mentioned are taking place, and that the case is incurable, the animal in consequence remaining lame through life. The above conditions may exist in a much milder form, and although the animal may suffer great pain he may still be able to place the foot upon the ground, and even travel; but during progression there is to be observed a peculiar sort of hop, and the movement of the limb in its course is suddenly arrested in a half-way manner, giving rise to what is called a 'catchy' gait. There is considerable difficulty in bringing forward the limb, which is observed with much greater facility when the animal is trotted. Sometimes the animal goes in a sort of an angular manner. The limb may also be brought forward with a circumductive motion, and the toe may be allowed to drag upon the ground during progression. Sometimes an examination per rectum reveals the presence of heat, and pressure may cause the animal to evince pain. Placing a suitable piece of board over the joint and striking it with a mallet is an old method of detecting the presence of disease in the hip-joint, a shock being thereby communicated to the hip-joint, when the presence of disease will often be made manifest by the animal showing pain, and on being trotted out the lameness is observed to have been increased by this procedure. In case the lameness, etc., be not increased by percussion, the fact should not be received by any means as absolute proof of the absence of disease in the articulation.

Treatment.—Absolute rest is imperative. Fomentations can scarcely be overdone, and should be applied for hours at a time, or cold applications may be used instead of hot, according to the state of the weather. Powerful counter-irritants, such as blistering, firing, or setoning—the latter often succeeds when all other means have failed—are also indicated. Firing is done either with the budding or the line iron, usually the latter, and the pattern selected is that of a star, either surrounded or not (at the fancy of the operator) with a circle. The centre of the circle is as near as possible over the hip-joint. The feather pattern may be used. The French recommend an operation by which the muscles over the articulation are divided, and the articulation being laid bare the hot iron is applied to it; but such an operation is very severe, and one not to be recommended in any but exceptional cases, in which all other means of treatment have been tried without benefit.

SPRAIN OF THE GLUTEUS MAXIMUS

One of the heads of the gluteus maximus is attached to the trochanter major, passes over the convexity, and is inserted into the ridge immediately below. This muscle may suffer from injuries, as sprains, etc., due to violent exertion, slipping, and various other causes. The injury having been received, inflammation may occur in consequence, and in some cases may extend to the bone.

Symptoms.—Sprain of the gluteus maximus is very difficult to distinguish from hip-joint lameness, and sometimes from lameness situated in the hock. It, however, does not give rise to symptoms as severe as those observed in hip-joint affections. The same peculiar rising and falling of the croup is present, and progression is accomplished with as little movement of the quarter as possible. The foot may be elevated from the ground and the gluteals kept in a state of relaxation, all strain being removed from them. If the foot is not elevated from the ground the toe is usually allowed to rest upon it, and the limb thereby kept in a state of flexion. Manipulation may cause the animal to show pain, after which, on being trotted out, the lameness is usually seen to be greater than before. Percussion over the region of the articulation will be followed by negative results. There is great difficulty in bringing forward the limb, and there is swelling more or less marked, which in affections of the articulation is absent. The swelling is usually seen with ease, but where it is slight it may be more readily detected by standing behind the animal and comparing the two quarters. After the swelling subsides atrophy may occur. A history of the case will afford material assistance in making a diagnosis.

Treatment.—The treatment is very similar to that of hip-joint lameness; and consists of the free use of hot fomentations and sedative lotions, followed by counter-irritants after the inflammation is allayed as much as possible. In this, as in hip-joint disease, slings may be necessary, and a long rest is indispensable; and in both conditions laxative and diuretic medicines, and a light laxative diet, will be found of benefit.

DISLOCATION OF THE HIP-JOINT

Dislocation of the hip-joint may take place in the ox, dog, cat, etc., but it is not possible for the head of the femur to become displaced in the horse, except in cases where fracture of the acetabulum occurs. This fact is accounted for by the presence of the pubio-femoral ligament in the horse, this ligament being absent in the other animals named. Dislocation of the hip-joint may occur very easily in the ox by violent exertion, slipping, or while being cast for an operation.

Symptoms.—The most prominent symptom is a shortening of the limb. There is also a certain amount of pain present, which is augmented on moving the parts. On a close examination, the part is found to present an abnormally prominent condition, and after a while a considerable amount of swelling ensues. The symptoms are about the same in the dog and cat.

Treatment.—Endeavour to reduce the dislocation by manipulation, extension, traction, etc., brought to bear on the limb. This is usually effected very easily under an anæsthetic in the dog and cat, but all efforts to reduce this dislocation are of doubtful efficacy in the case of the ox, which, if fat, should be slaughtered.

SPRAIN OF THE PATELLA LIGAMENTS

The stifle-joint is a very important articulation. The patella is situated on the outer side. There are straight and lateral ligaments in common attached to the patella, and also ligaments common to the femur and tibia, interosseous ligaments, etc. Sprain of some of the straight ligaments may be caused by direct or indirect injury, as falls, slips, blows, etc.; and is most common in horses used for fast and hard work—being common among horses which have a great deal of travelling up and down hill, stopping and starting suddenly, turning quickly, etc., while drawing a heavy load.

Symptoms.—If the ligaments are severely injured, there will be considerable difficulty in bringing forward the limb, flexion of the joint is not properly performed, and in some cases there is a tendency to drag the toe; these symptoms increase and become better marked. On causing the animal to trot, he may go a short distance, and then hop on the sound limb, keeping the affected one elevated from the ground for a step or two, after which he will allow it to descend to the ground, and again trot off on it. There is much greater difficulty in bringing the limb forward than there is in hip-joint or hock lameness. On comparison of the affected joint with the sound one of the opposite side, it is discovered that there is a peculiar and unnatural prominence of the former; in some cases there seems to be as much difficulty in using the limb as though the patella had become dislocated. Every endeavour of the animal, whether being exercised or standing still, seems to be directed to flexing or using the joint in any way as little as possible. Negative symptoms, or the absence of disease in any other part of the limb, will often be of great assistance in arriving at a correct diagnosis. Professor Dick used to tell his pupils to examine the foot, although the leg was broken; and the advice was very good, as a thorough examination will not often result in a mistaken diagnosis.

Treatment.—The sooner such a case is treated the better. Hot fomentations and sedative lotions are to be used in the early stages, when pain and heat are present, after which a vesicant should be applied, so as to invest a considerable surface, and the animal should be allowed a long rest.

Dislocation of the Patella.—It is seldom that complete dislocation of the patella takes place, because complete rupture of the internal lateral ligament would first have to occur. Partial dislocation, however, is [illegible] very common occurrence, the bone slipping to the outside in all cases; it being, on account of the structure of the parts, almost an impossibility for the bone to slip to the inside.

Causes.—Dislocation of the patella may be caused by falling, slipping, stepping on a cobble stone, or a stone that rolls or gives way, particularly if the animal is trotting. It is also sometimes observed to follow debilitating diseases, as influenza, etc., in consequence of general weakness or relaxation of the muscular system, etc. It may also be due to scrofulous ostitis, or may occur in consequence of an hereditary tendency, faulty conformation, etc. Allowing a weakly colt to run on a hilly pasture may also produce the condition, it occurring sometimes in colts only five or six weeks old.

Symptoms.—The symptoms are very well marked, and, having seen one case, there will be no difficulty in recognising any cases that may subsequently be met with. In walking, the animal brings the limb forward in a stiff manner, and as though there was scarcely an articulation in it, the foot drags on the ground in going forward and in backing, and in some cases the foot seems as though nailed to the ground, or as though fastened in a hole in the floor, a mistake easily made where plenty of bedding is on the floor. It is said that a former pupil of the Ontario Veterinary College, now a prominent practitioner, was once sent to examine such a case, and returned with the information that the animal had got his foot fast in a hole in the floor, and was unable to extricate it. There is a peculiar stiffness of the hindquarters, the animal goes along in a stilty manner, and a clicking sound may often be heard during progression. When the animal lies d [illegible] frequently has great difficulty in rising, and in some cases is totally unable to rise. In cases of some standing an exudate may be thrown out, causing a thickened condition of the part, the irritation may extend and increase, and it finally becomes a bad case, and one difficult or impossible to cure.

Treatment.—The treatment is often troublesome, especially in an unbroken colt. The first thing to do is to reduce the luxation, which is not at all difficult, and is accomplished as follows: stand the animal against the side of a stall, place one end of a soft cord or line of sufficient strength around the fetlock or pastern of the affected limb, place the free end of the cord in the hands of an assistant, and direct him to gently draw the limb forward; this done, the practitioner can, by manipulating and pushing the bone, force it into place, the bone slipping into place with a clicking sound. In some cases, by exciting the animal, as by whipping, causing him to move suddenly, etc., the bone may be caused to return to its place. But the method previously described is the surgical and proper way of reducing the luxation. After the bone has been restored to its place, the free use of cold water, astringent lotions, etc., is highly beneficial. A pitch charge may be employed in cases where it is difficult to retain the bone in place. Mildly stimulating liniments are also very useful, and in many cases it is necessary to apply a vesicant. Moderate exercise on level ground after a while tends to restore the muscles and ligaments to their natural condition. In many cases it is necessary that the foot shall be brought forward and retained by a cord reaching from the pastern to the collar or neck. The cord should be so arranged that the foot just touches the ground, but cannot be put back behind the level of the other. In exercising an animal, if it is the patella on the near side that is dislocated, the animal in turning should turn to the opposite, or off side, and *vice* reved. It may be necessary, in some cases, to elevate the hind quarters, which may easily be done by standing the animal in a stall with a floor sloping forward.

Disease of the Semilunar Cartilages.—The semilunar cartilages of the femoro-tibial articulation are liable to disease, in consequence of hard work, injuries, etc.

Symptoms.—The animal has a certain amount of difficulty in extending the limb, and on being allowed to rest a day or two he improves, but on being driven becomes worse. Before very long more or less swelling occurs, this being followed by wasting of the muscles of the haunch, the cartilages becoming inflamed and even ulcerated.

Treatment.—Counter-irritation may be tried, but it is usually hopeless, the condition, as a rule, causing permanent lameness.

Sprain of the Vasti and Rectus Femoris Muscles.—This sprain gives rise to pretty severe symptoms. It may be caused by slipping, falling, etc.

Symptoms.—The animal has very great difficulty in extending the limb. During progression the toe is dragged along the ground to a greater or less extent, and the animal drops very much, the stifle descending to a considerable extent and bulging out. There is a swelling, sometimes well marked, which usually disappears in a few days, and is succeeded by atrophy. The lameness is generally excessive. If the tendinous portions of the muscles are affected, the prognosis is very unfavourable; but if the injury is confined to the belly or fleshy portion of the muscles, a cure may be expected to result from treatment. But from three to eight months will elapse before the cure is complete.

Treatment.—The treatment consists of plenty of rest, the free use of fomentations to allay pain and irritation, after which, stimulating liniments may be freely applied. As a rule, counter-irritation, in the form of a vesicant, will be found of great service. In some cases it may be necessary to place the animal in slings.

SPRAIN OF THE FLEXOR METATARSI

The flexor metatarsi is attached to the femur, tibia, and head of the metatarsal bone. Injury to this muscle sometimes occurs from falls, jumping, being halter-cast, or cast for an operation. Galloping an entire horse, or other horse if in high condition, may cause sprain of this muscle.

Symptoms.—The symptoms of this condition are very peculiar. Shortly after the injury is received the muscle loses its power of contraction to a great extent, and the opposing muscles at the back of the limb, retaining their contractile power and meeting with no opposition, cause the limb to fly upward and backward with great violence, where it remains and hangs dangling as though broken. When the limb is brought forward, and the foot placed upon the ground, the animal stands firmly upon it, and apparently without any difficulty, but on endeavouring to take a step, or as soon as the weight of the animal is removed from the affected limb, it flies back, and hangs dangling, as before. If the tendinous portion or insertions of the muscle are injured, it is best to destroy the horse; but if the injury be confined to the fleshy portions of the muscle, treatment may be employed with a fair prospect of success.

Treatment.—Cold irrigations are to be used frequently, and long at a time. After the irritation, swelling. etc., are allayed, mild stimulating liniments may be freely used, or, what will be found of still greater benefit, vesicants, applied as may seem judicious. The horse should be slung wherever possible, as total rest is absolutely necessary. If the animal is fed well and properly cared for, a complete cure will usually result in about a month or six weeks; but in cases where the tendinous portions of the muscle are affected, the cure will take much longer, if it can be effected at all.

Gastrocnemii.—Injuries to the gastrocnemii muscles occasionally take place, occurring in various ways.

Symptoms.—In this lesion the limb also hangs pendulous, the symptoms being very similar to those of the condition last described, with the exception that the limb hangs forward instead of backward. It is not so well marked as sprain of the flexor metatarsi.

Treatment.—Is the same as for sprain of flexor metatarsi. If the tendon is severed, and the animal is valuable enough to treat for a long time, it should be sutured with wire or silkworm gut.

BOG SPAVIN

A bog spavin may be defined to be a soft puffy tumour situated on the antero-internal aspect of the hock-joint, and consisting of a distension of the capsular ligament with synovial fluid, which, in consequence of some irritation, has become greatly augmented in quantity, and causes a bulging out where the capsular ligament is not bound down. Bog spavin is similar to, but is a more serious condition than, windgall, because in the former condition the capsular ligament is involved. In the healthy hock-joint there is usually about ʒii. of synovial fluid to be found, while in a hock where there is bog spavin there may be ʒvi. or ℥i. found, and a very large hock may contain a greater quantity still. Bog spavin is most frequently met with amongst heavy horses, and in such animals very little importance is attached to its presence unless actual lameness is present in connection with it. But in light horses, or horses used for fast work, the presence of bog spavin or any unnatural fulness in the region of the hock should always be viewed with the greatest suspicion. Neither thorough-pin nor bog spavin, except in very rare cases, appears to do any harm when occurring in heavy horses. Bog spavin and thorough-pin usually co-exist.

Symptoms.—The symptoms of bog spavin are very plain: the swelling can be easily seen. It varies greatly in size, and is usually compressible and cool; such a bog spavin is not likely to do any harm. If tense and hot it shows that there is a certain amount of irritation in connection with it, and a deposition of calcareous matter may be taking place, or if already deposited it may be detected by the fingers on making a careful examination, and when found feels hard; such a case is likely to cause trouble, hence the practitioner, when examining a horse as to soundness, should always make a very careful examination, and be cautious in giving an opinion in regard to a bog spavin. As a rule, in heavy horses bog spavin is not considered as constituting an unsoundness, unless there is heat, calcareous deposits, or lameness, etc., present, and clearly attributable to the bog spavin. On the other hand, the presence of a bog spavin in a light animal, or an animal used for fast work, in any stage whatever, and whether accompanied or not by calcareous deposits, heat, lameness, etc., must be considered as constituting an unsoundness, and such an animal should be rejected on examination.

Causes.—Bog spavin is usually caused by hard and fast work, irregular or too little exercise, high feeding, etc., in other cases it may be produced very easily, as by a short drive; especially is this the case where an animal is predisposed to it. Young horses are more liable than old and mature animals. Occasionally, after a heavy horse has been caused to exert himself, and is allowed to stand in the stable all night, in the morning a puffy swelling may be discovered on the antero-internal aspect of the hock-joint, and on being examined it is discovered to be a true bog spavin.

Treatment.—In many cases it is not deemed worth while to treat a bog spavin—that is, where it occurs in a heavy horse, and seems to do no harm; and as symmetry and beauty are not much cared for in such horses, as long as it constitutes nothing more than an eyesore it is rarely treated. If plethoric, the animal should be reduced to a slight extent, a laxative may be administered and followed by diuretics. Hot and cold applications, preferably the latter, should be freely used, and astringent lotions are often found to be of great benefit. Hand-rubbing, also, is useful, pressure is of very great benefit, and may be applied by means of a bog-spavin truss. Where the truss cannot readily be obtained, other bandages may be applied, and arranged so as to firmly secure pads immediately over the seat of the enlargement. The use of the actual cautery, followed by vesicants, is frequently of great benefit. Some practitioners recommend the removal of the fluid by means of the aspirator, and the injection of iodine or other fluid. In some cases it may do well, but frequently it causes great irritation, and inflammation of an alarming character, the whole limb swelling to a great extent, and the animal may be rendered useless In cases where bog spavin is accompanied by extensive irritation, the irritation should be allayed in the usual way as far as possible, and counter-irritants employed, in some cases the actual cautery being employed with benefit, as in windgalls. Free incision of the true hock-joint, under the strictest antiseptic precautions, has given success,* but should only be adopted as a last resort.

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* *Journal of Comparative Pathology and Therapeutics*, vol. xiv., p. 79 (Hobday).

THOROUGH-PIN

Thorough-pin is a bursal enlargement, and is usually defined as being distension of the bursa in connection with the flexor pedis perforans muscle. It is commonest among, and more likely to occur in, heavy horses, and more especially in horses having heavy, thick, and straight limbs. It varies to a great extent in size, in some cases being no larger than the point of the little finger, in other cases attaining the size of the closed hand. In a great many cases of bog spavin, thorough-pin is present also, probably because the distension of the capsular ligament interferes with, to a certain extent, and sets up irritation of the bursa, causing increased secretion of its fluid, and consequent distension of the bursa itself. Pressure upon the swelling on one side of the limb generally causes it to disappear on that side, and appear on the other side of the limb. Hence the name 'thorough-pin.' It rarely produces lameness, and as a general thing is not to be considered as a serious condition by any means.

Treatment.—The treatment of thorough-pin is about the same as that for windgalls, bog spavin, etc. A thorough-pin truss is easily applied, and should be used, being of great benefit. Cold irrigations and astringent lotions, the white lotion being one of the best, may be used. Vesication is also frequently beneficial. Cantharides is as good as any counter-irritant in the treatment of thorough-pin; it may be prepared and applied in the ordinary way and of the usual strength. In the winter-time the animal should be turned out. It is wonderful how great benefit cold has on thorough-pin, frequently the animal after running out all winter coming up in the spring with his limbs as clean and free from thorough-pin as ever they were, although when put to work again the swelling often reappears. Iodine used externally is often useful, as it tends to cause absorption of the fluid. Some practitioners recommend removal of the fluid contained within the bursa by the operation of puncturing, and allowing it to escape or be forced out by pressure, after which a truss is applied to prevent further distension. Such a procedure, in my opinion, is not desirable, except in certain rare cases, and must be then done under the strictest antiseptic precautions. Where it is decided to open the bursa and remove the fluid, the aspirator should always be used.

CAPPED HOCK

Capped hock consists of a little enlargement appearing on the point of the hock, and is sometimes due to distension of the small bursa situated immediately beneath the skin. In other cases it may be due to distension of the large bursa situated between the gastrocnemii externus and internus. This latter is the more serious form of the two, and the case is still more serious when the bursæ mentioned are both affected.

Causes.—Capped hock is usually caused by blows, kicks, etc., or may be due to a slightly dropsical condition, resulting from some cause not apparent, or as the result of passive congestion. This is frequently the cause in heavy horses with sluggish circulations. It also occasionally follows diseases of a debilitating character, as influenza, etc. Where an animal is met with having capped hock and a vicious eye, the indications are that he is a kicker. Capped hock may occur in any class of horses, but is most common among heavy animals, such horses, from their sluggish circulations, etc., being more predisposed to this and similar conditions than the light class of horses, the latter rarely suffering from capped hock, except as a result of direct injury, as kicks, blows, etc. In some cases the animal may be actually lame in consequence of capped hocks, but such cases are very rare. It is a blemish, but when it does not cause lameness, or interfere in any way with the usefulness of the animal, it cannot be considered as an actual unsoundness.

Treatment.—Capped hock, trivial though it may be, is nevertheless very difficult to treat successfully, and if of some standing, the practitioner should explain to the owner that it will take a long time to effect a cure. If the case is the result of an injury recently received, fomentations and sedative lotions should be employed to reduce any irritation that may be present. Hand-rubbing and the application of a mild, stimulating liniment will be found of benefit. Astringent and cooling lotions are also very useful. Bandages, preferably of rubber, are highly beneficial, applied so as to exert a gentle pressure upon the enlargement, the chief difficulty being to retain the bandages in proper position. If the enlargement still remains after the above treatment has been pursued for two or three days, iodine in its various preparations may be used, and vesicants will be of benefit, Hydrarg. Biniod. being the best application in this trouble. The exciting cause should always, if possible, be discovered and removed. Hence, if capped hock is found to result from pressure on the point of the os calcis when the animal is lying down, the parts should be protected in some way by a pad, or the bedding in the stall should be abundant and soft, so that the part cannot be bruised. If it is caused by the animal kicking, it may be necessary, when he is a persistent kicker, to place hobbles on him while in the stable, so that he can lie down etc., but cannot kick. Capped hock is best seen by a side view. Where serum or pus has formed, it may be necessary to open up and allow the contents to escape; but it should not be opened so freely as capped elbow, as in some cases there may ensue a considerable amount of inflammation. A seton may sometimes be passed through the enlargement, and the contents allowed to drain for a few days. The wound should be kept clean, and dressed in the ordinary way; and if it is summer-time it should be protected from flies, etc., carbolic acid lotion being excellent for this purpose. If possible to cure in any other way, it should never be opened, as afterwards the exudate shows a tendency to solidify.

CURB

Curb is an enlargement situated on the posterior aspect of the hock. It is due to rupture or sprain of the calcaneocuboid ligament, and in come cases probably the sheath of the flexor tendon is involved, but not the tendon itself. Of course, it is possible for the tendon to suffer from a sprain, but sprain of the tendon in this region is rare.

Causes.—Animals of a certain conformation are predisposed to curb. An animal having a long narrow hock and long metatarsal bones, or one with a coarse or bent hock, is more likely to suffer from curb than an animal with a well-shaped hock. The exciting causes may be said to be hard and fast work. Any violent exertion or movement in which the parts are subjected to a severe strain may produce it. Hence, often a horse has curb in consequence of running, jumping, playing, rearing, etc.—rearing with a heavy rider on the back being a very prolific cause of curb. Driving an animal in deep snow will produce it as quickly as any other cause. Slipping may also cause curb, as will backing a horse very rapidly, or when he has to move a heavy load. It is of more frequent occurrence in young than in old animals, and is also more serious. Associated with curb, in a young horse predisposed to it there is frequently found a sort of puffy tumour, extending up the groove which is situated a little to the inner side and through which the flexor pedis tendon plays. This variety is difficult to cure, requiring a long time, and after the acute symptoms have disappeared, if the animal is put to work too soon, he will very quickly become lame again.

Symptoms.—The presence of a curb is, as a rule, easily detected. The animal has more or less difficulty in extending the limb, there is an enlargement on the posterior aspect of the hock-joint, situated some little distance below the point of the os calcis, and extending perpendicularly from above downward, thus giving the hock a bowed or bent appearance, which is most readily detected by standing on one side of the animal and viewing the part. Heat, which is often considerable, is present, and manipulation may cause the animal to give evidence of some slight pain. There is also lameness, more or less marked, and a peculiarity of curb lameness is that if the animal be allowed to rest for a couple of days or so, he may go sound apparently, and be perfectly free from lameness, but after driving awhile, he becomes lame again. It is probable that in most horses having curb there is a slight predisposition. In many otherwise well-formed hocks there may be noticed a slight prominence, perhaps not more than half an inch in length, located on the seat of curb. Such a conformation may be said to predispose, and on putting such an animal to severe work the chances are that a fully-developed curb will appear. On flexing and manipulating the hock, etc., and trotting the animal out, it may be observed that the lameness is increased.

Treatment.—Hot fomentations and cooling lotions should be used in the early stages. The animal should be shod with a shoe having a moderately high heel and no toe. Refrigerants, as ice-water, etc., are very useful; anodyne liniments are also of great benefit. Rest is absolutely necessary. After the irritation has subsided to a certain extent, counter-irritants should be employed in the shape of vesicants, using those that will not blemish. The vesicant should be a good strong one, and in exceptional cases it may be necessary to use the firing-iron, but it should only be used as a last resource, and is sure to blemish. In some slight cases of curb, where a horse is wanted for a particular day, and cannot be laid off work for longer than a couple of days, it may be relieved by the use of refrigerants, as ice-water, etc., plentifully applied. Plumbi Acetas in solution will be found of great benefit. As much rest as possible should be allowed, and the chances are that the animal will be got ready for the day he is wanted.

SPRUNG HOCK

Sprung hock is a sprain, or an enlarged and inflamed condition of the tarsus in general, involving the whole of the articulation, and is of most frequent occurrence in horses having crooked hocks and long metarsal bones.

Causes.—This condition may arise from injuries to the part sustained while running away; it may also be caused by falls, slipping, kicks, blows of any kind, etc., and may be associated with fracture of one or more of the bones composing the joint.

Symptoms.—The animal is extremely lame, stands with the hock flexed, never attempts to place any weight upon the limb, and there is a well-marked, puffy swelling on the inner aspect of the joint; but in severe cases the swelling may extend around the whole articulation, which may attain an enormous size, and take on an appearance somewhat similar to that of lymphangitis. It is a very serious injury.

Treatment.—Absolute rest must be allowed the animal.

Hot fomentations and cooling lotions are of value, and should be long and frequently applied. Refrigerants are very useful, and none more so than ice-water. If the exterior is injured, deep-seated suppuration may occur, causing severe and increasing pain, and sometimes fluctuation, in which case the parts should be opened up and the pus allowed to escape, after which cleanse thoroughly and apply antiseptic lotions. Counter-irritation is in many cases of very great benefit.

Sprain of Flexor Tendons below the Hock.—Sprain of the flexor tendons is not nearly so common in the hind as in the fore legs, but on account of the long hair of this part in certain classes of horses, may not always be noticed.

Sprain of the Suspensory Ligament also occurs, and the fetlocks are sometimes bruised and injured, especially in racehorses and those doing fast work.

Treatment.—This is the same as that already mentioned when these conditions are met with in the forelegs.

OPEN-JOINT

This is one of the most serious injuries to which the horse is liable. The joints most frequently laid open are those occupying the most exposed situations, as the fetlock, stifle, hock, and knee. Frequently cases of opened bursa are met with and mistaken for open-joint; and, although often very serious, open bursa can only be considered as a condition of a very trivial character in comparison to open-joint. The temperament of a horse has much to do with the result of open-joint, a dull, phlegmatic animal standing a much better chance to recover than an excitable, highly bred, or irritable animal. In these latter the inflammation runs much higher, and all the various symptoms, which in any horse are severe enough, are in these increased to a fearful degree of intensity. A very common termination of open-joint in highly bred animals is death; but, as before stated, if it occurs in an animal of a phlegmatic temperament, and the case is got without delay and treated, the chances of recovery are much better, the inflammation not being so severe, and the constitutional fever not running so high. However, even in those animals, if not quickly controlled and held in check, death often results; and in those cases where the life of the patient is saved, the best result that can be expected is partial or complete ankylosis of the joint.

Causes.—Open-joint may occur in a variety of ways, as by kicks, blows of any kind, falls, punctures, etc. When the joint is opened by a clean incision, the case is more favourable to treat than when it is opened in any other way; the most unfavourable form of open-joint to treat being that produced by a kick, as, besides, the joint being opened, it may be associated with fracture, and is most certainly associated with ostitis, and a lacerated and bruised condition of the soft tissues in the vicinity of the wound.

Symptoms.—In a case where the skin, ligaments, and synovial membrane are opened or divided by means of a sharp-cutting instrument, and the surrounding tissues not bruised, etc., there may not be any very severe symptoms presented for some little time—twenty-four to forty-eight hours; but the synovia escapes, pus organisms gain entrance to the wound, irritation and severe inflammation follow, accompanied by great swelling, and the suffering of the animal becomes most agonizing, and, unless speedily checked, death is certain. At first the discharge consists of pure synovia, which escapes freely and regularly. Soon a change takes place in the character of the discharge, and pus is observed to be mixed with the synovia. After awhile the discharge becomes streaked with blood, or takes on red or rusty sort of tinge. This is a sign that caries is going on, and that absorption of the cartilages and articular surface has taken place, and the blood occurring in the discharge is coming from the ulcerated surface of the bones. At this stage the best result that can be hoped for is ankylosis of the joint. In some cases there may be a considerable flow of pus, and the integrity of the joint not be interfered with; but if the pus is fetid and streaked or tinged with blood, as above described, and there is great constitutional disturbance, the practitioner may know that the case is hopeless. Even the pain and symptomatic fever are often sufficient to produce death. The appetite is completely lost or seriously impaired, great thirst is present, the body becomes bathed with sweat, the pulse is quick and weak, the mucous membranes are blanched, the general appearance of the animal indicates suffering of a very severe character, great emaciation supervenes, and death occurs in a short time. Or in some cases infiltration of pus may occur in connection with the tissues in the vicinity of the injury, with sloughing of an extensive character, formation of sinuses, etc. These results are most likely to occur in open-joint of the hock, and such a case is hopeless.

Treatment.—The successful treatment of open-joint is a matter of great difficulty; there is no specific for it. It is very essential that the joint be kept in as motionless a state as possible, as every movement aggravates and increases the inflammation of the parts, which are already inflamed to a degree almost unbearable. The patient also should be kept as quiet as possible; sightseers, curiosity seekers, and everything tending to excite the animal or disturb his quietude, should be rigidly excluded. The patient should be tied up short in a stall or loose-box, or in some cases it is of great advantage to place him in slings; if an irritable animal, he should be allowed to tire himself to a certain extent before being slung. Open-joint causes great irritation and inflammation in the tissues around the joint; particularly is this true in the case of the hock-joint. If the animal is restless, has a quick pulse, and there is great heat and pain in the part, fomentations may be used, and opium administered in the usual quantities, to allay the pain and irritation. The practitioner should be careful about probing wounds in the neighbourhood of joints, as open-joint may thus be produced when it did not at first exist. To stop the flow of synovia, a piece of lint saturated with one of the bland oils may be applied to the wound; this, as it were, forms a nucleus around which the discharge gathers, and leads to the formation of a scab; or the parts may be painted with collodion, and a Derby bandage applied, not too tightly; and in cases where everything is favourable the wound may heal in a day or two. Plaster of Paris, flour, alum, or a crystal of Hydrarg. Perchlor., are useful to arrest the flow of synovia, and are applied by dusting on the wound. In some cases a blister is of great benefit, as it causes swelling, and consequent closure of the wound. A poultice, when considered necessary, may be applied, soothing and allaying irritation of the parts. Wheat-flour and oatmeal make a good poultice, and have a tendency to coagulate the synovial fluid. Remove and apply a fresh poultice two or three times daily. When a coagulum of synovia forms, closing the mouth of the wound, great care should be taken not to disturb it, as its presence will not only prevent any further escape of synovia, but will also prevent the entrance of organisms into the articular cavity, both of which are matters of the utmost importance. After the coagulum is formed a vesicant may be employed, extending completely around the articulation, and investing a considerable surface. Refrigerants are also of use if applied judiciously and at the proper time. The medicinal remedies are opium, in the usual sized dose to allay excessive pain; a laxative or a mild cathartic, followed by diuretics, is valuable to allay inflammatory action; and for the same purpose an occasional dose of aconite may be administered at the discretion of the practitioner. As before stated, if the pus be of a sanious or fetid character, the best result that can be hoped for is ankylosis. Carbolic, chinosol, or other antiseptics should be used, and in summer cold water irrigations used continuously, but on no account should the wound be injected. If the wound is extensive, and there is nothing but synovia issuing from it, the edges should be shaved and drawn together with suture of silver wire, silk, or catgut, and treated as above directed; but if there is a discharge of pus, the wound must not be closed, or the pus, being unable to escape, will burrow in various directions between the bones and through the soft tissues, and render hopeless a case that might otherwise have made a very good recovery. If the knee-joint be the one opened, the parts may be kept quiet and immovable (and great benefit derived thereby) by the use of splints. Sometimes granulations, more or less exuberant in character, spring up. If not too luxuriant, their presence cannot be considered as a bad sign; if they are too luxuriant, caustics may be used to reduce them. The diet of the animal, if he will eat anything, should be of a light, easily digestible, and nourishing character. Open-joint, when occurring in connection with the stifle or hock, is very often fatal.

CHAPTER XIII

Diseases of the Feet

LAMINITIS

LAMINITIS signifies inflammation of the sensitive laminæ, and is not a very good term, inasmuch as it is not sufficiently comprehensive, because not only the sensitive laminæ are affected, but the whole of the sensitive structures of the foot are more or less involved in the inflammatory process. It occurs in the acute, subacute, and chronic forms. The acute form is a very painful affection, as exudation takes place after inflammation, and, being unable to escape, presses upon the sensitive structures of the foot, causing pain of a most agonizing character. Laminitis is also known as fever in the feet, founder, etc. Frequently, in consequence of the intensity of the disease, improper or too long-delayed treatment, etc., separation of the sensitive from the insensitive laminæ takes place, and the os pedis descends, constituting a condition known as 'pumiced foot.' In resolution, the exudate is removed by the absorptive process. When it is not absorbed, it is greatest at the toe, and pumiced foot results. In other cases the os pedis may not descend, but the irritation being kept up, the function of the coronary substance is more or less interfered with, and as a result the hoof grows down in a series of rings of an irregular appearance. These rings must not be confounded with those seen in the hoof after a run at grass. The latter are fairly equidistant from one another all the way round, whereas those of laminitis are closer together in the middle than at the heels. It is confidently asserted that laminitis is the most painful of all diseases to which the horse is subject, a statement which will be readily credited when the structure of the foot is taken into consideration, the parts affected being largely supplied with nerves and bloodvessels, and consequently extremely sensitive and highly vascular. In these structures, as in all others, a certain amount of swelling supervenes upon inflammation; but the structures, being enclosed in the hard and unyielding hoof, are firmly bound down, as it were, and as a fearful pressure is brought to bear upon the nerves of the part, it naturally gives rise to pain of the most excruciating character. Occasionally suppuration occurs in connection with the sensitive laminæ, and sometimes necrosis of the pedal bone takes place.

Causes.—Some horses may be said to be predisposed to laminitis. Such animals have large bodies with small legs and weak feet; and those animals having flat feet are also more or less predisposed to an attack of laminitis. Such animals, however, do not suffer the most severely; but when a horse with strong, deep, and round feet is attacked, his suffering is greater than that of such a horse as above described. The exciting causes are hard and fast work, especially in localities where the roads are paved. This form of laminitis is the most serious. An animal with high pounding action is likelier to suffer from an attack of laminitis than an animal having a low smooth action. Shoeing improperly is another cause. It is also likely to follow any irritation or derangement of the digestive system, such as may be induced by the administration of food or drink in excessive quantities. Certain kinds of food (as barley, wheat, Indian corn) in excess tend to produce laminitis. It has frequently been known to follow parturition, in consequence of the irritation existing in connection with the generative system. It is not unusual for this condition to follow after an animal has been allowed to partake of large quantities of cold water when heated by exercise.

Excessive quantities of food taken under the same circumstances, by causing indigestion, may cause an attack of laminitis. It occasionally occurs in one foot only, and in such a case may be due to driving the animal with a shoe off, or the animal may have stood upon that foot for several days, in consequence of severe lameness in the opposite foot. It occurs in the hind-feet less frequently than in the fore-feet. Occasionally all four feet are affected, this form being rare, however, and likelier to follow some irritation of the digestive organs, than to be caused in any other way.

Symptoms.—In the acute form of laminitis the symptoms are plain, and the disease readily recognised. The disease is usually ushered in by well-marked rigors, which quickly give place to pyrexia, the latter being well marked. On taking the pulse, it is found to be somewhat increased in rapidity, and is slightly fuller than usual. In a large majority of cases the first symptoms to attract notice are stiffness and stumbling during progression, and the pulse slightly quickened. As a rule, the patient persistently retains the standing posture, and a characteristic of the pulse is its full and bounding character, which it retains for several days together, varying from fifty to eighty beats per minute. The fever steadily increases, and finally becomes very great; so great does it become sometimes that it might lead the practitioner to suspect the case to be one of lung disease. Sweats bedew the body; constipation, more or less marked, is almost an invariable symptom, being absent only in such cases as are caused by super-purgation, etc.; the urine is voided in less than the usual quantities, and is high-coloured. If all four feet are affected the animal stands with all of his feet gathered together well up under the body, and the back is roached. This posture has led some practitioners into the mistake of supposing the case to be one of kidney disease. The countenance of the patient bears an anxious expression, and is a very fair index of the agony the animal is suffering. On walking up to the animal and attempting to back him, he offers all the resistance in his power. This overcome, he moves backward only with the greatest difficulty, and with every manifestation of severe pain, dragging his feet along on the ground after him, and often giving vent to a groan.

The breathing is usually affected to a considerable extent, being more or less accelerated, and greatly resembles the breathing of pneumonia. On compelling the animal to walk, he does so in a peculiar stiff manner, and exhibits a strong tendency to stumble, even on ground perfectly level. Another symptom that may be observed is that the patient makes every endeavour during progression to bring the heels to the ground first, and keep the toes from touching the ground at all. On standing still, if the fore-feet are affected to the exclusion of the hind-feet, this being the most common form of laminitis, he stands with the hind-feet well up under the body, and supporting the most of its weight, while the fore-legs are stretched out in front, with the heels resting upon the ground. Some animals very quickly assume the recumbent posture, finding considerable relief thereby; hence the practitioner often finds, on reaching his patient, that he is lying down. If the animal is allowed to remain in this position it may lead to a mistaken diagnosis, as bowel trouble, etc.; for this reason, if for no other, the patient should be forced to rise. The animal may require considerable whipping before he will rise, but will finally do so. On rising he makes a spring with his hind-feet, and immediately stumbles forward with a groan, when the practitioner may feel certain that the case is one of laminitis. On making an examination great heat may be readily detected in the region of the coronet, and sometimes it may be detected through the hoof; there is also throbbing of the plantar arteries. When the hind-feet only are attacked, he still stands with all four of his feet under him in an endeavour to rest the heels of the hind-limbs upon the ground, and to place as much of his weight as possible upon the fore-limbs. If it becomes necessary for the patient to change his position, in doing so he puts his feet to the ground very gingerly, and raises them every now and then with a violent jerk similar to that of stringhalt, and it might almost lead one to think that the animal was suffering from that form of chorea. The mouth is found to be hot and feverish, and a peculiar clammy sort of sensation is imparted to the finger placed within it. Anorexia, partial or complete, usually the latter, is observed; abdominal complications sometimes occur, and are manifested by the usual symptoms, and may, where the practitioner is careless or ignorant, lead to a mistake in diagnosis, and, as a matter of course, improper treatment, which will in every case lead to serious results. Laminitis is of frequent occurrence on board ship, such cases being caused by the animal standing on the hard board floor, horses rarely lying down on board ship or train so long as there is any appreciable motion, but obstinately persisting in standing until compelled to lie down from sheer exhaustion; especially is this true in the case of young and irritable animals unused to travelling. Those animals, however, that are used to travelling, as racehorses, etc., soon get over their fear, and, accommodating themselves to circumstances, lie down and rest during transit from one race-meeting to another. Cattle also readily lie down on shipboard, hence on this account do not suffer from laminitis so frequently as horses. Acute laminitis often runs its course to a favourable termination within a very short period, and usually occupies from six to ten days. As a rule, treatment is successful, but occasionally the disease terminates fatally, especially in cases where the bone becomes affected.

Treatment.—The treatment of laminitis, to be successful, must be prompt and energetic. Venesection during the primary stage of the disease is frequently attended with great benefit, and more especially in the case of plethoric animals, or those working hard every day and in good condition, that are sufficiently strong to bear a copious abstraction of blood. The abstraction of blood may be general from the jugular vein, local from the artery of the toe, or it may be both general and local; but in any case a sufficient quantity of blood should be drawn to have a perceptible effect upon the pulse and course of the inflammation; but what is probably far superior to phlebotomy as a curative measure is the internal administration of arterial sedatives, the one most frequently used, and from which the best results are obtained, being aconite in the form of tincture. As there are several tinctures of aconite, which vary greatly in strength, it is essential that the practitioner should be acquainted with the strength of the various tinctures, and administer each in doses properly regulated in accordance with its strength. Potassium nitrate is almost indispensable in the treatment of laminitis, and probably has a slightly sedative action in addition to its well-known febrifuge and diuretic actions. When given, it should be in good-sized doses, so that it will fully establish its action in as short a time as possible. A full dose of cathartic medicine should be administered without delay on the first appearance of the disease, except in such cases as are induced by superpurgation, etc., when it should be withheld. Constipation, until catharsis becomes fully established, may be relieved by enemas freely administered. In the greatest number of cases it will be found advisable to remove the shoes, allowing them to remain only in cases where the foot is bad and of a weak conformation. After removing the shoes, the wall should be rasped down to a certain extent. Fomentations as hot as the animal can bear may be freely used, and should be applied from the knees down, being valuable to soothe and allay irritation, after which poultices of boiled turnips, linseed-meal, bran, etc., may be applied for four or five days, being changed as often as necessary, at the end of which time a very perceptible improvement will almost invariably be noticed, and all the symptoms will show that recovery is taking place. In some cases, where the patient persists in retaining the standing posture, it becomes necessary to lay him down, and once down, he will almost invariably remain in that position on account of the relief experienced. Cold applications are very good, as cold water, cold poultices, etc., more especially during the summer season. If the animal does not obtain relief in four or five days after the above treatment has been employed, the practitioner may know that exudation more or less copious has taken place, and it must be removed by cutting in at the toe and allowing it to escape. This done, relief is quickly obtained. A very slight exudate may be removed by the absorptive process, which may be materially hastened by putting the animal on a course of potassium iodide. When recovery is taking place, slight exercise, such as moving the animal round the stall in a gentle manner, will be found beneficial. At this stage a bar-shoe, made thin at the heel, should be put on. The shoes should not be allowed to remain off too long, neither should poultices be continued for too great a length of time, or undue softening of the hoof will result. Poultices of cow-dung are highly injurious, and should never be applied under any circumstances whatever, such applications seriously interfering with, and in many cases completely checking, the growth of the horn. If the animal has had one or more previous attacks of laminitis, or has pumiced foot, or a foot weak or bad in any way, it is usually advisable not to remove the shoe, but it should be loosened. When venesection is practised, it should be borne in mind that a much smaller dose of cathartic medicine will suffice than when no blood is taken. The patient should be allowed to have plenty of pure cold water to drink, giving it in small quantities, but very often. If large quantities are allowed while under physic, it may interfere with its action; otherwise it is valuable to allay fever, cooling the animal and favouring diuresis. The after-treatment consists of dieting the animal on food of a light and laxative character, paying attention to the general health, and using carefully for some time.

Laminitis, Sub-acute and Chronic.—These forms of laminitis are caused by excessive work, irregular exercise, and occasionally may arise from some irregularity in feeding, etc.

Symptoms.—the pulse is sometimes slightly quickened, but usually its beat is normal. When travelling, the animal goes stumbling and bobbing along, as though having but little control over his feet. Horses having small or flat feet are subject to this form of the disease. The muscles of the chest wither away, and the symptoms presented are very similar to those of navicular disease, from which, however, it may readily be distinguished, as there is more heat in the foot than there would be in a case of navicular disease.

Treatment.—The treatment of these forms of laminitis is more tedious, and not attended with as much success as when the disease occurs in the acute form. Poultices should be applied, and a purgative may be given, and followed by diuretics. Potassium iodide is often useful in these varieties of the disease. Counter irritation applied in the region of the coronet is highly beneficial. Use cold applications, remove the shoes for awhile, and be careful how he is shod, as a great deal depends upon the shoeing.

Pumiced foot is that condition of the foot in which the coffin-bone descends, in consequence of separation of its attachments, presses upon the sole, and causes it to become more or less convex. This condition occurs as a result of laminitis occurring in the acute or sub-acute forms, and may come on without any well-marked symptoms of pain ever being shown. It may also be caused by improper shoeing, and cutting away the wall too much each time the animal is shod. The os pedis, in some cases, may force its way through the sole, and in such a case it is the best plan usually to destroy the patient.

Treatment.—The treatment consists of removing the shoes, a free use of hot or cold applications to the coronets, and the use of poultices, to be followed by blistering. Rest is also very essential. The after-treatment consists in shoeing the animal properly, a bar or round shoe being the best to apply, this being arranged so that the weight will bear altogether upon the wall and frog, and not upon the sole. Such an animal should be used very carefully, and never driven or ridden rapidly, especially on a hard road. He will do very well for work on a farm or on soft land.

CORNS

A corn consists of a bruise of the sensitive sole and laminated structure of the bars in the angle of the heel, causing a greater or less extravasation of blood, which, if extensive, permeates, and causes a reddened appearance of the horn, when it is said to be a corn. It is situated between the bars below and the os pedis above. It is a disease extremely common, and one to which all horses are liable. Corns are of most frequent occurrence in connection with the fore-feet, and are, when present, almost invariably found on the inner side, and but rarely on the external side. They are classified in various ways, probably the best classification being that in which they are described as hard, soft, and suppurating. A hard corn consists of an infiltration of blood into the horny tissue. Soft corns are characterized by a certain amount of blood being extravasated, more or less inflammation, and an exudation of a serous character. A suppurating corn is one in which pus has formed, suppuration occurring in consequence of previous inflammatory action. This is the most serious, and unless treated in time is likely to cause considerable damage.

Causes.—Shoeing, which may be said to be a necessary evil, is, when improperly done, undoubtedly a very prolific cause of corns. Horses with broad flat feet are more subject to corns than horses having good strong feet. However, it is of far greater severity when it occurs in the latter. The ordinary seated shoe will not, as a rule, produce corns, but corns may result from it owing to its being applied in an improper manner; for instance, it may be applied in such a way as to press upon the heel, and the animal being driven, particularly on a hard road, the shoe bruises the foot and a corn is the result. In shoeing by the Charlier method, the whole weight is thrown upon the sole and wall of the hoof, and by this method of shoeing corns are exceedingly rare. Broad-seated shoes are also good where there is any tendency to corns. In some cases the bars of the foot will attain an enormous size from some cause, as unnatural secretion, etc., and consequently, when the animal is travelling, readily come into contact with some hard substance, as a pebble or stone; a bruise follows, and a corn is the result.

Symptoms.—The animal is lame, in some cases extremely so. If suffering from corns in both fore-feet he usually points the foot when he stands. The lameness may be best observed by causing the animal to trot slowly. There is heat in the neighbourhood of the part, the heat in some cases being very perceptible. On squeezing the foot with the forceps the animal flinches, and shows every evidence of pain. If the forceps cannot be got, a light hammer will do, which is to be used to tap the foot with, when, if a corn be present, he will flinch, as described above, and on being trotted out immediately afterward it may be observed that the lameness is greater than before. When walking as a general thing, the animal shows a strong tendency to stumble. There may be a slight puffiness, and knuckling of the fetlock-joint. To such an extent is this latter symptom presented in some cases as to mislead as to the seat of lameness. By cleaning the sole over the seat of corn redness may often be detected, and once in a while pressure upon this part with the fingers will elicit some expression of pain from the animal.

Treatment.—Remove the shoe, and having decided that a corn is present, cut or pare down carefully, using a suitable knife. Digging down, as is so often done, is highly objectionable. When the corn is reached, the pus, if any be present, should be allowed to escape. The heel should be cut down, and the sole pared until it feels elastic under the thumb, but care should be taken not to go so deeply as to cause a flow of blood. Give as much frog-pressure as possible, place a poultice on the foot, and give the animal a few days' rest; afterwards put on a bar-shoe. Generally speaking there is no shoe equal to a round shoe in such a case. A one-half or three-quarter shoe may be used in some cases. The shoe recommended by Professor Williams is a very good one. A short shoe, narrow at the heels, is also a very good shoe. Place the animal in a loose-box, and exercise him daily on the snow if it is winter. Sometimes a fungoid growth springs up when suppuration has occurred;

in such a case it must be cauterized by antimony chloride, silver nitrate, or some other caustic, but do not pour nitric acid on it, as is a favourite practice with some, or much harm may result.

THRUSH

Thrush results from an irritation set up in connection with some of the sensitive structures of the foot, and more especially a diseased condition of the fatty frog, and is characterized by a discharge of a purulent character from the cleft of the frog.

Causes.—Thrush may be caused by standing in filthy stables, or running in filthy barn-yards, hence it occurs more frequently in the hind than in the front feet. It may also be present in navicular arthritis, in consequence of the irritation of the navicular bone reaching to and causing irritation of the fatty frog. Another prolific cause of thrush in horses in training is the immoderate use of cold water. Stuffing the feet with cow-dung and similar irritating substances also produces the condition. The heavy breeds of horses are the most frequent sufferers from thrush. It cannot be considered as a very serious condition, and seldom produces lameness, unless the foot is placed upon a small stone or something similar, when, owing to the sensitive condition of the foot, the animal may go lame for a few steps, and then be all right. Temperature seems to exert some influence in the production of the disease, which is more common in warm than in cold climates.

Symptoms.—As before stated, there is a discharge of pus from the cleft of the frog. The pus is of a yellowish colour, but very dark (in some cases may very properly be described as almost black), and is possessed of a horribly offensive odour, which, if smelled once, will never be forgotten. There may be lameness, but, as a rule, this symptom is absent. There is usually tenderness present, in a degree more or less marked, and if the parts come into contact with any hard substance, as a stone, etc., the animal will flinch, and perhaps go lame for a short distance.

Treatment.—Remove the exciting cause. If the animal has been running in a filthy stable or barn-yard, he should be placed in quarters free from filth and dampness; remove the shoes, pare down the frog and sole generally; thoroughly cleanse the parts with a weak solution of phenol in warm water and soap, after which apply a poultice of linseed or any good material, for a period of twenty-four or forty-eight hours, at the end of which time, the irritation being allayed, the poultice may be removed, and carbolic acid, in the proportion of one part to sixteen of water, applied on a pledget of tow. Cupri Sulph. and Zinc. Sulph. in solution are also useful. Zinc. Chlorid., etc., may often be used successfully, but what appears to be nearly a specific for thrush is Hydrarg. Subchlorid., to be applied in sufficient quantities by dusting it into the cleft and over the parts affected; this done, a pledget of tow and tar should be placed over it, arranged so as to cause slight pressure, a moderate amount of pressure on the parts being very useful. Thrush is not usually difficult to cure when the discharge is not due to navicular disease.

PUNCTURED WOUNDS OF THE FEET

Punctured wounds in the feet are of very frequent occurrence, more especially in the neighbourhood of iron works nail factories, etc. These wounds are usually caused by nails, screws, broken glass, tacks, etc., and according to the depth and situation of the wound there are symptoms presented of greater or less severity. If the joint be penetrated, or the bone interfered with, serious symptoms will invariably be presented. On the other hand, a nail may pass up by the side of the horny frog, through the fatty frog, and very deeply into the foot, and no very well-marked symptoms be exhibited or serious consequences follow. If the navicular bursa or the tendon of the flexor pedis perforans has been wounded serious results are to be apprehended. An injury to the navicular joint is one of the most painful and serious injuries to which the foot is liable, and when it does not terminate fatally it almost always results in destruction of the joint. With all foot-wounds the risk of tetanus must not be forgotten.

Symptoms.—It is by no means a very easy thing in all cases to detect a nail in a horse's foot, hence a very close and thorough examination should be made in all cases, or mistakes in diagnosis will be very liable to occur. If a punctured wound occurs in the fore-foot in connection with the sensitive structures, lameness suddenly becomes manifested. When standing quietly the animal may be seen to nurse the foot, elevate the heel, etc., and in a few hours increase of heat can be detected around the coronet. These symptoms should lead the practitioner to suspect the presence of some foreign body in the foot, and by removing the shoe, cleaning the horn, and paring it down well with the draw-knife, the cause of the trouble may be discovered; but even after paring down the horn, etc., it is frequently a matter of great difficulty to find the offending agent. In many cases, especially in the case of a nail in a piece of wood, the nail, having entered the foot and produced the injury, is at once withdrawn, leaving no sign except the opening it made, which, on account of its small size and becoming filled with mud or some other substance, is more or less effectually hidden, and its presence can only be made manifest by the most thorough examination. The practitioner should examine more particularly in and by the frog, and anything looking like a bruise or an opening should be explored. Pressure of the fingers, or tapping lightly with a hammer over the suspected part, may elicit some expression of pain from the animal. If the wound occurs in the hind-foot, the animal, when walking, extends the foot well, and perhaps more than usual, elevating the heel at the same time in an endeavour to relieve it of all weight. When standing he rests upon the toe. There is also more or less knuckling of the fetlock-joint. There may be considerable fever, and the irritation may extend upward, in some cases to the stifle-joint, and cause an immense amount of swelling, accompanied by great pain, loss of appetite, and more or less constitutional disturbance, as elevation of pulse, well-marked fever, etc.

Treatment.—Having searched for and found the offending agent in the foot, it should be removed without delay. No more of the horn should be cut away than it is absolutely necessary to remove, as bad results sometimes follow too much paring. There should be applied a pledget of tow, saturated with some strong antiseptic, to the wound in such a manner as to completely close it, and prevent the entrance of air, dirt, etc. The animal should be kept standing perfectly quiet until all danger is past. Sometimes, when an animal is put to work too soon, say in a couple of days after the reception of the injury, suppuration takes place, and lameness more or less severe results in consequence, which would not have been the case if the animal had been kept quiet. When suppuration occurs, the knife should be used to cut down and allow the free evacuation of the pus. If this is not done, and at the proper time, the pus will seek an outlet of its own, and after burrowing in various directions, and causing considerable suffering to the animal, will most probably escape at the coronet and cause quittor. The practitioner, during the search for the offending agent, should be careful not to wound the healthy vascular structures, as the resulting hæmorrhage will obscure and seriously interfere with his operations. Fomentations will be found valuable to cleanse and soften the parts, allay pain, etc: Poultices may be applied after the fomentations, at the discretion of the practitioner. Any constitutional symptoms that may arise are to be combated in the usual way by the administration of cathartics, diuretics, febrifuges, sedatives, etc., as are indicated, and the use of fomentations, anodyne applications, poultices, etc., locally, to allay irritation. The portion of frog or sole that it has been necessary to remove will very quickly be reproduced, and in cases that recover the animal is usually ready to go to work in a few days. If fungoid growths spring up, they are to be treated in the usual way by caustics, the hot iron, etc. Sometimes the sole becomes under-run, and pus forms at the base of the frog. In such a case allow the pus to escape, and remove all useless or semi-detached pieces of horn, etc., keep clean by an occasional bath of tepid water, and use antiseptic lotions, such as those of carbolic, creolin, zinc chloride, etc., and, if considered necessary, an occasional poultice. When ready for work, dress the foot with hot tar and shoe with a leather sole.

PRICKING; NAILBOUND

Pricking a horse when shoeing him consists of driving the nail into the sensitive structures instead of through the insensitive horny wall of the hoof. A nail may split, and one portion go in the right direction and the other portion be forced into the sensitive structures. Hence pricking is in many cases purely accidental and unavoidable, and may occur with even the most careful shoer, especially if a faulty nail be used. The walls of the hoof may also be abnormally thin, or the animal may make a sudden jerk while the nail is being driven, and its course be thereby changed. In many cases, however, it is due to carelessness on the part of the shoer. If the nail is withdrawn at once and the animal kept perfectly quiet, as possible no bad results will follow; but often the smith does not know that he has pricked the horse, and in other cases he may be aware of the fact, but refrains from mentioning it, the result being great lameness in a day or two afterward. Again, lameness may be produced by the shoulder of the nail pressing upon the sensitive laminæ, in consequence of the nail having been driven too near without having actually touched the sensitive structures. The foot is then said to be 'nail-bound.' In such a case the animal often remains sound for a week or so, and then becomes lame. Again, the lameness may be developed by the animal stepping upon a stone, and thereby increasing the slight irritation already present from the nail. When the practitioner is told that the horse has recently been shod, and has become lame, he should examine the situation of the nails, when usually one nail will be seen to have passed a little higher than the others. The animal should be caused to walk and trot, his action and the degree of lameness, meanwhile, being carefully observed. After which, tap on the suspected spot, or use the pincers, and trot him again, when it will be observed that the lameness is greater than before. In other cases a hole may be seen, showing that a nail has been driven and withdrawn, probably because the smith had become aware that he had pricked the animal. The appearance of such a hole should be regarded as a suspicious circumstance, and after examination the shoe should be removed and the knife used to make a dependent opening to allow of the free escape of any pus that may be present. A poultice should also be applied and the animal kept perfectly quiet. In some cases inky-coloured pus will escape, and the discharge may be very fetid in smell. Whatever it consists of, it must escape in some way; and if a dependent opening is not made for it, the probabilities are that it will come out at the coronet and form a quittor, or that the limb may become gangrenous. In other cases the irritation and inflammation may give rise to alarming symptoms, be followed by extensive suppuration, and cause separation of the horny from the sensitive laminæ to take place. The sole becomes under-run, and this has to be cut away and new horn allowed to grow, the animal in the meantime being allowed to rest. If there are any signs of irritative fever manifested, the animal should be given a laxative, and the symptoms combated as they arise. The diet should be of a laxative character. If fungoid growths spring up they are to be reduced by caustics, as chloride of antimony, silver nitrate, or, in exceptional cases, the hot iron may be used. When sending to work the foot should be dressed with tar and a leather sole put on.

CANKER

Canker consists of a malignant growth of a fungoid nature, and frequently follows upon some injury to the sole or frog. It has been said to be of parasitic origin, a fungus being suspected as the actual cause, but this has not been indisputably proved. Thrush is also said to be a cause of canker. It may be situated near the point of the frog, or may occur in the cleft of the same structure. Some horses are more or less predisposed to canker, particularly the heavier breeds. Separation of the sensitive from the insensitive sole takes place, and a growth of an extremely vascular nature springs up and extends partially over the foot, causing a considerable amount of suffering. On the

American continent canker usually occurs in a mild or non-malignant form.

Symptoms.—On an examination, the foot is found to be hot and tender, the frog soft and spongy, and in a short time the growth makes its appearance; it is very vascular, on being cut bleeds freely, and sometimes there is also a discharge of a very fetid odour. The growth extends, and may involve the whole of the sole and frog. The animal is also more or less lame. The disease is characterized by a tendency to spread, and ultimately, if not checked, produces deformity of the whole hoof, with more or less rapid degeneration of the whole horny tissue.

Treatment.—The treatment of canker is tedious, and not always successful, it being in all cases difficult to cure. The knife must be used freely; the walls are to be cut down, all useless or semi-detached portions of horn being removed, after which the hot iron may be used; but caustics in the liquid form are better than the hot iron. Malcolm of Birmingham recommends (after stripping off all the diseased parts) the careful and thorough application of equal parts of sulphate of copper, iron, and zinc, with crude carbolic acid and vaseline to make it into a paste. He has recorded some excellent results and permanent cures.* Professor Williams recommends chromic acid in the treatment of canker, but it must be applied very carefully, as it is a strong caustic. A favourite recipe of Professor Dick's was the following: Cupri Diacetate, ʒii.; Acid. Sulphuric., ʒii.; Pix Liquida, ℥xvi., to be applied as often as is considered necessary. It is good practice to change the dressings occasionally. A well-marked case of canker is very difficult to treat successfully, and to cure requires, under favourable circumstances, a period varying from six weeks to two months. After the diseased condition is subdued by proper local treatment as directed above, and constitutiona remedies, as the administration of laxatives, alteratives etc., a run at grass for a time will be found to have a beneficial effect.

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* *Journal of Comparative Pathology and Therapeutics*, vol. v., p. 48.

SAND-CRACK

A sand-crack consists of a fissure, or solution of continuity in the horny material of the wall of the hoof. The fissure extends through the wall, and in a direction parallel to that of the fibres of the horn. These fissures may exist in any part of the wall, and according to their situation do they receive various names. Thus, a crack in the wall on its anterior aspect is known as a centre-crack, while one occurring on the quarter is called a quarter-crack. This latter form or variety is the most common, the inner quarter of a fore-foot being the most usual situation of sand-crack. The general name of 'sand' crack is applied to the condition because it is more common amongst horses kept upon a hot sandy soil, such a soil being supposed to exert some influence in the production of cracks in the horn. Sand-cracks are said to be complete when they extend from the coronary band down to the plantar border, and are designated as incomplete when they extend only a portion of the distance between the two points named. Occasionally sand-crack exists on the outside quarter of the wall. When in the hind-foot it is usually of the variety designated as centre-crack, or toe-crack, the reason being that this is the part of the wall upon which most pressure is put.

Causes.—Certain breeds and strains of horses are predisposed to sand-cracks, those having thin and brittle feet being especially liable to cracks in the hoof. In many cases it is unquestionably due to an hereditary predisposition. Sand-cracks are very common amongst running and trotting horses, owing to the nature of their work, and the fact that they are usually, on the American continent at least, exercised on hard tracks. Shoeing with high-heeled and high-toed shoes has a tendency to produce sand-crack, and certain influences, as irregular exercise, high-feeding, etc., by interfering with or impairing the normal secretion of the horn, may predispose to the condition. Hot and dry weather, standing on a very hard and dry floor, and dryness to an unnatural degree of the horn from any cause whatever, undoubtedly exert a certain amount of influence in the production of sand-crack. There is nothing better for a horse's feet than to be out on a wet day, the dampness keeping the horn pliable, moist, and tough, hence acting very efficaciously as a preventive of sand-crack.

Symptoms.—The crack usually appears very suddenly. The animal shows more or less lameness, and on an examination being made, a slight crack is discovered just between the hair and the hoof, and there may be a slight oozing of blood. The solution of continuity is of course the special characteristic of the condition. It may exist for a day or two without producing lameness, and in some cases the presence of the crack is the only symptom. Generally, there is more or less lameness in connection with it, from the fact that when the foot is placed upon the ground the crack spreads, and on removing the foot from the ground the crack closes, and, pinching the sensitive structures, gives rise to pain and lameness. The crack usually commences above, and extends downwards. Sometimes the crack may be concealed by the hair around the coronet, and a frequent practice of dishonest persons before offering such a horse for sale is to conceal the existence of the crack by filling it with various substances, as guttapercha, shoemaker's wax, tar, hoof-ointment, etc.; and, if skilfully done, the existence of the crack can scarcely be discovered, defying any but the closest scrutiny. Sometimes leading the animal through mud two or three inches in depth is practised, the mud effectually concealing the crack, and at the same time the presence of the mud is not likely to excite suspicion. The practitioner, when examining a horse as to soundness, cannot be too careful in looking for such conditions, and must be on his guard against such fraudulent practices. When a centre-crack exists in the hind-foot, and extends from the coronet to the toe, the pain and lameness is far greater than in a quarter-crack.

Treatment.—Remove the shoe, and by poultices or long-continued baths of warm water, allay the irritation and soften the horn, after which trim the edges of the crack nicely so as to leave them smooth. The broken horn must be separated from the healthy. At its superior termination a groove must be made transversely in such a manner that the crack cannot extend any further. The groove must pass completely through the horn to do any good, and can be made with a sharp firing-iron or the farrier's knife. In many cases it is successful in preventing further spread of the crack. Another good way is to fire pretty deeply in the shape of the letter V. In a few days the iron may be applied a second time, each time going a little deeper, until the sensitive structures are reached. The French recommend an operation by which a portion of the horn is stripped off with forceps, and the crack is thereby given a triangular-shaped termination and cannot extend any further. The irritation caused by stripping the horn off is allayed by fomentations, astringent lotions, etc. In most cases it is necessary to apply a bar or round shoe, and give plenty of frog pressure. The wall is to be cut down so that the shoe cannot press upon the crack. Bandaging the foot with tarred cord or tape is also useful to keep it from spreading. A nice light brass plate or clench, to prevent motion in the hoof, is a very useful thing, the whole secret of success being to prevent motion of the parts. A farrier's nail can be adjusted for the same purpose, and answers admirably. This done, growth of the horn should be stimulated by the application of vesicants, etc., to the coronet, and the crack will grow out in time.

CAULKS, OR TREADS

Injuries of this description are very common, especially during the winter season, when shoes with high and sharp heels and toes are used. A tread, or caulk, is caused by the heel of the shoe, the animal inflicting the injury upon himself, or, in case two animals are being driven together, one may inflict the injury upon the other. These wounds may be very serious, or may be of a very trivial character. One of the latter kind, however, may, by neglect, develop until it becomes very serious, and produce great trouble, perhaps permanent injury, to the animal. Occasionally hæmorrhage of an alarming character results, horses sometimes bleeding for twenty-four hours, and becoming much weakened. Hæmorrhage in this region is best checked by perchloride of iron applied on wool or tow, the whole being secured in place with a bandage. Pressure around the fetlock will often check the flow of blood. The compress should be retained in place for twenty-four hours, or longer, as in exceptional cases hæmorrhage will recur after the compresses have been allowed to remain in for eight or ten hours and then removed. A careful examination should always be made as to the condition of the parts. If the lateral cartilages are not injured, the case will usually be easy and very satisfactory to treat; if they have sustained any injury, it constitutes a more serious condition, and a cure will be in many cases difficult to bring about. All loose or hanging pieces of skin should be detached, any dirt, hair, or other foreign body that may have been forced into the wound should be carefully removed, and the wound thoroughly cleansed with tepid water. As a rule, if the tread is very bad, considerable irritation results, suppuration takes place at the head of the hoof, and the animal suffers great pain, often holding the foot elevated from the ground for quite a while, especially if it is one of the hind-feet, and he becomes reduced in condition very quickly. The pus has a tendency to burrow in various directions and form quittor.

Treatment.—Remove the shoe, and cut or rasp down carefully to the bottom of the wound, after which foment in antiseptic water, poultice, and apply antiseptic or astringent lotion. Any reliable antiseptic will do—creolin, chinosol, perchloride of mercury, chloride of zinc, or carbolic acid, are all used largely. Where the cartilage is cut into by overreach, the parts should be brought together by a bandage; but (as frequently happens) in two or three days the part cut may be observed to protrude backward, and, as it is very evident in such a case that the parts will not adhere, the loose portion should be removed. In some cases an animal receives a tread in front. The irritation ceases, or is allayed by the usual methods, for the time being; but as the horn gradually grows down, irritation is again set up, suppuration occurs, which is known by the animal becoming very lame, and on gently tapping the old wound with a hammer the patient at once evinces pain. It is good practice to remove the shoe and give the foot a thorough examination, and in some cases a small quantity of pus may be found imprisoned. In such a case use the knife and rasp freely, and allow the pus to escape, after which apply a poultice and some antiseptic. Before cutting down, the operator should be sure of the existence of pus in the parts. After the wall is thinned, if pus is present, pressure with the thumb will cause the animal to flinch.

QUITTOR

Definition.—A sinuous wound of the coronet often extending down between the sensitive and the insensitive laminæ, and sometimes penetrating deeply and involving the bone. It is a serious condition, and especially so when occurring in an animal having a heavy, strong hoof.

Causes.—It occurs as a result of neglected treads, pricks, etc., and is more especially liable to follow punctured wounds in the region of the frog. Suppurating corns may also produce quittor. Suppuration occurring in the foot, from any cause whatever, may result in quittor, for the reason that the pus, being unable to escape, extends in various directions, destroying the tissues in its course, increases in quantity, until, finally reaching the head of the hoof, and being no longer confined by the horny wall, it bursts forth, making an outlet for itself at the coronet, when it becomes known as a quittor.

Symptoms.—Usually the first symptom to attract attention is lameness, which is generally well marked. On examining the parts, a hard swelling is discovered at the head of the hoof. This swelling in a day or two becomes soft, and finally a discharge of pus takes place ; but a sinus remains, and the wound shows no disposition to heal. Sometimes the irritation extends and involves the whole coronary substance, and perhaps a half-dozen or more openings may be present at one time ; such a case is very serious.

Treatment.—Quittor once well established is very difficult to treat successfully, and in all cases the treatment is tedious, and occupies a long time. Nothing short of the most energetic treatment will prove successful. The original cause of the trouble should be ascertained, if possible. If taken in time, remove the shoes, and cut down the wall immediately below the abscess; thin down the sole even to the quick, and allow the pus to escape; use a probe, and ascertain, if possible, what structures are diseased. In [illegible] where the pus has forced its way out at the coro[illegible] shoe may be removed and the sole cut down, w[illegible] cases it will be found that the pus has burro[illegible] through until checked by the horny sole—in su[illegible] a dependent opening should also be made. It [illegible] found necessary to cut down the wall below the [illegible] in some cases the sinus may be scraped [illegible]ing that will cause considerable hæmorrhage,* or [illegible] necessary to strip off a portion of the wall. Any [illegible] operations may cause considerable irritation, which may be allayed by fomentations and poultices. Hydrarg. Perchlor. in solution may be used to inject the sinus, or grs. ii.—iii. may be wrapped up in tissue paper, made into the form of a cone, and pushed down into the sinus; in two or three days a slough separates and comes away. If the wound now looks red and healthy, treat with mild astringent and anodyne lotions; if it still looks pale and unhealthy, repeat the operation until the wound takes on a healthy appearance. This is known as 'coring out.' If the lateral cartilages are affected, it constitutes a more serious case, and the foot will probably become deformed and remain so. As a rule, quittor can be guarded against, but occasionally a caulk will degenerate into a quittor in spite of all the treatment that can be brought to bear. Sometimes it may be necessary to cast the animal before a proper examination of the parts can be made. After the discharge ceases and the wound heals there may be some slight tenderness of the parts remaining, in which case a vesicant will be of use. If the lateral cartilages are diseased pretty extensively, it may be necessary to remove them. Quittor is an unsoundness in all its stages.

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* To lessen this a tourniquet should previously be put tightly around the fetlock or heel.

BRUISE OF THE SENSITIVE SOLE

Bruises of the sensitive sole may occur in many ways, as by stepping on a stone or other hard substance, while travelling rapidly, or may be caused by a shoe upon a naturally thin sole, or a sole that has been cut down too much. It may also be caused by pressure upon it by the os pedis in the condition known as pumiced foot, etc.

Symptoms.—There is usually considerable lameness manifested by the animal. On examination, an undue amount of heat is found to be present, and on tapping or pinching the parts the animal flinches. There may also be more or less extravasation of blood. The shoe should be removed, as a better examination can then be made. In some cases it might almost be mistaken for a case of navicular disease. Sometimes the animal evinces only a little tenderness during progression, no well-marked lameness being-present.

Treatment.—Remove the shoes and apply a poultice, after thinning the horny sole to a certain extent. The poultice may consist of linseed-meal, bran, turnips, etc., or a mixture of any two or all of them. Fomentations and cold applications will be of considerable use in allaying the irritation. Keep the feet moist for a day or two, and give the animal rest. As a rule, he quickly recovers.

SEEDY-TOE

The term 'seedy-toe' has been applied to a peculiar condition of the horn of the toe, which, in consequence of having undergone some degenerative process, is rendered soft and crumbling. In many cases the horn can be readily broken down with the thumb and fingers. A small or a large portion of the horn may be affected. This condition may gradually spread, and exist for a long time before lameness becomes manifested, but where the process is allowed to go on without interruption, the occurrence of lameness is only a question of time, being certain to appear sooner or later.

Causes.—Seedy-toe may in some cases be due to an hereditary predisposition on the part of the animal, the feet of certain animals being, generally speaking, more liable to disease than the feet of others; but probably it is most frequently caused by the large toe-clips that are so commonly used, which, by pressing down upon the fibres of the horn, interfere with their nutrition, and seedy-toe is the result. Any irritation causing impaired secretion or interfering with the nutrition of the horn may have the same effect. Seedy-toe, while in many cases not accompanied by lameness, is nevertheless an unsoundness, and consequently should receive attention when an examination is being made as to soundness.

Treatment.—Remove the shoe, and cut down the toe, scraping out all the diseased horn; the sole and wall may also be cut down to a certain extent. Poultices should be applied, the hoof kept moist, and counter-irritants applied to the coronet; afterward applications of cold water to the coronet will be found useful to stimulate the growth of new horn. If the sensitive structures are exposed and much irritation exists, it may be allayed by means of poultices, fomentations, etc., and the opening should be closed by applying a pledget of tow saturated with some moist substance, tar being as good as anything. It need not be considered as an incurable condition, generally speaking, but it is tedious, as considerable time is required for new horn to grow. The shoe, when replaced, should have quarter-clips placed well away from the diseased spot.

False Quarter. — 'False quarter' is the term used to designate a cracked condition in the horn of the quarter of the hoof. It is usually due to an injury in the region of the coronary substance, a certain amount of the secreting surface of this being destroyed or perverted. This produces an abnormal growth of horn, which is harder than the normal growth, indented, and at first sight looking much like sand-crack. An examination will, however, reveal the absence of any definite opening in the wall of the hoof. As a rule, if lameness does not ensue, it is not looked upon as an unsoundness, although it is a deformity.

Treatment.—False quarter will often remain through life, and treatment is rarely adopted.

NAVICULAR DISEASE

This disease is also known by the names of coffin-joint lameness, contraction, etc., the latter name being the one commonly applied to the disease fifty or seventy-five years ago, as it was then supposed that the contraction was the cause of the accompanying lameness; now it is known that contraction is not a disease of itself, but occurs as a symptom or result of disease, as navicular disease, for instance. Laminitis in its subacute and chronic forms also has a tendency to cause contraction of the heel, and it also occurs as a natural result of improper shoeing. Atrophy is a better term to apply to the condition, as the hoof contracts in consequence of atrophy of the structures contained within it.

Navicular disease may be defined to be an inflammation set up in the navicular bone, bursa, or the flexor pedis perforans tendon. Considerable discussion has been caused, and much difference of opinion is held in regard to which of the above structures is the first to become affected by the inflammatory process. The generally received opinion now is that while the disease may originate in any of the structures previously mentioned, it originates—at least, in a large majority of cases—in the bone or cartilage, but occasionally begins in the bursa or tendon, probably as a result of direct injury to the parts. The disease is a very common one, especially amongst certain classes of horses. However, it is probable that other and very different conditions are frequently mistaken for navicular disease, hence it is not quite so common as some may suppose it to be. It is not at all uncommon to hear of cases of navicular disease in which quick and permanent cures were made: it may be well to state that when navicular disease once becomes well established, a permanent cure can never be effected, and in cases where the so-called quick cures took place, the chances are that such were not cases of navicular disease at all.

Pathology.—The cause having operated, inflammation becomes established in connection with the cancellated structure of the navicular bone. The inflammatory process gradually extends to and involves the articular cartilage, which undergoes destruction by ulcerative absorption; the tendon becomes involved more or less, inflammation occurring in connection with it, and generally adhesions take place. The disease is always confined to the inferior surface of the navicular bone, and in connection with the tendon, there being no record of a case ever having been discovered in which the superior surface of the navicular bone had been ulcerated; the bursa also undergoes destruction, and lameness becomes established. The progress of the disease, as described above, is sometimes very rapid, in other cases its progress is slow, and may extend over a period of several months, or even years.

Causes.—The great exciting cause of navicular disease is hard and fast work, particularly on hard roads. An hereditary tendency may also be mentioned as a predisposing cause, apart from vices of conformation. Individual animals, as well as certain breeds of horses, are more or less subject, the disease being most frequently met with in those horses having short upright pasterns and a pounding action. The horses least predisposed to the disease are those with oblique pasterns, the weight in such animals being removed from the coffin-joint. But even in such a case the natural protection afforded by a faultless conformation can be—and frequently is—set at naught by shoeing with high-heeled shoes, by means of which the articulation is straightened up, weight is thrown upon the coffin-joint, and the navicular bone now becomes exposed to injury by concussion. The disease is often caused by allowing a horse to remain idle for a few days, feeding him highly in the meantime, then taking him out and giving him a severe drive or ride on a hard road, and more especially if the animal is predisposed on account of faulty conformation, or is improperly shod, etc. It is of most frequent occurrence amongst horses used upon hard roads, as saddle and carriage horses, and sometimes trotting horses and racehorses on the American continent, as they usually race on hard tracks. It is rarely seen in racehorses in Great Britain, as they are properly shod, and, although doing fast work, it is on the grass or turf and soft ground. Direct injury to the perforans tendon, as by a punctured wound, may also be mentioned as a cause of navicular disease, and it is also said to be due in some cases to a rheumatoid diathesis. Navicular disease occurring in a hind-foot is very rare, the disease being principally met with in the fore-feet, usually one foot only being affected, sometimes, however, both fore-feet become affected; in some cases simultaneously, but most frequently one at a time. Navicular disease in all its various stages constitutes unsoundness, and as it may in some cases exist for months before any actual lameness appears, the practitioner cannot be too careful in his examinations as to soundness; hence any undue heat or tenderness, contraction of the heel, inequality in the size of the feet, should be regarded with great suspicion, and its nature demonstrated if possible by a thorough examination.

Symptoms.—Navicular disease is very difficult to detect in its incipient stage. As a rule, the animal nurses the foot more or less, relieving it of weight, and pointing it an inch or so in front of its fellow. In some instances the limb may be extended, and the foot held quite a distance in front of the other foot; but these symptoms are not always noticed, and when they are noticed, by no means constitute absolute proof of the existence of disease, as an animal perfectly sound will sometimes get into the habit of pointing, but in such a case generally rests one fore-foot and the hind-foot of the opposite side at the same time; he also changes after a while to the other feet, and rests those stood upon but a short time before, while if an animal points from disease, he invariably points with the limb affected. As a rule, lameness is the first symptom to attract attention. It may come on suddenly and be severe, or may be gradually developed and be slight. On being first brought out of the stable a slight lameness is observed, *which disappears with exercise,* the impediment of gait, in many cases, ceasing to be perceptible after the animal has been caused to travel a distance of only a few yards—an indication pointing to the existence of joint disease. The same symptoms are presented the next time the animal is taken out, causing the owner to devote more attention to the condition than was accorded on its first appearance. If both fore-feet are affected, the animal, on being allowed to rest, may be observed to point first one and then the other foot, and when coming out of the stable goes in a groggy manner, being very tender, stiff, and short in his action, but on going a few hundred yards, and becoming warmed up, these symptoms decrease or entirely disappear. Another well-marked symptom, especially when one foot only is affected, is atrophy of the inside quarter of the hoof, and contraction of the heels. The quarter has a peculiar straight appearance. This is after awhile succeeded by a general decrease in the size of the foot, in consequence of the soft tissue contained within the hoof having become atrophied, the atrophy being more or less due to functional inactivity, the foot not being used as much as it should be, the animal resting it whenever opportunity offers. The horny frog usually presents a small and shrivelled appearance, in some cases dwindling in size until scarcely any frog remains. Thrush will probably be present, and there is frequently observable a well-marked concavity of the sole; the animal shows a disposition to go upon the toe, and has a strong tendency to stumble. In some cases, while driving or riding an animal in which no positive symptoms have as yet been observed, he suddenly stumbles, and almost or quite falls, even when on a perfectly level piece of road where nothing can be discovered to account for his stumbling. In a day or two afterwards a slightly abnormal degree of heat may be discovered to exist in the foot, but he is bathed, etc., and it disappears, only to reappear in a short time, when it may be slightly more troublesome to get rid of. Thus it goes on for two or three months, or longer, before any well-marked symptoms of the disease appears. Such symptoms are premonitory of navicular disease. The symptoms of navicular disease are also said to be negative and positive. The negative evidence of navicular disease is absence of disease in any other part of the limb, and the practitioner may be often struck with the fine, clean appearance of the affected limb, there being no windgalls or anything of that sort to mar its symmetry, the general appearance of the limb being much finer than that of its fellow. Soon general atrophy of the limb takes place, the muscles of the shoulder and arm waste away, and what some people call 'sweeney' is now present, but there is not the well-marked atrophy of shoulder-slip. There is more or less atrophy of the pectoral muscles, and a falling in of the chest. On a careful examination being made, the toe of the shoe on the affected foot will be found worn in a much greater degree than its fellow of the sound limb, on account of the animal going upon the toe of the foot affected. In most cases an abnormal degree of heat can be detected in the region of the coronet. A hammer may be employed to tap gently on each side of the frog in the region of the bars, when usually the animal will evince pain by flinching, and endeavour to get the foot away. Pressure in the heel while flexion and extension of the parts are performed will cause the animal to show uneasiness, and in many cases manifest considerable pain. Immediately after this he should be caused to trot, when the lameness may be observed to be greater than before. When standing, if both feet are affected, the animal keeps continually shifting his weight from one side to the other, and often so great is the pain that, on being left to himself, he immediately lies down, and will scarcely stand up long enough to take his food. In such a case he gradually falls off in flesh, and plainly shows that he is suffering pain of a most agonizing character. Occasionally a case may be met with in which there is no atrophy of the foot perceptible, and the animal yet be a confirmed cripple from the disease. A peculiar trembling motion of the limb is often seen, being best observed when the animal is standing at rest; and in a confirmed case, when he is made to move, he does so with a sort of uncertain action, a trembling and a general appearance of weakness of the limbs, which, together with the pointing of the foot and general action of the animal, are symptoms highly suggestive to the practised eye.

Treatment.—Navicular disease when well marked is incurable, hence treatment is adopted only with the view of palliating the disease, or alleviating the suffering of the animal. The shoes should be removed, the toe shortened, and the lower border of the wall rasped down. In some cases the sole may be thinned, and in all cases the foot should be brought into as good shape as possible. Occasionally bleeding from the artery of the toe will be found to be of considerable benefit. Fomentations are very useful, and the foot should be kept in a warm-water bath for hours at a time, and on removing it from the bath a poultice should be immediately applied, and allowed to remain until it is desired that another bath be given; by these means growth of horn will be promoted, and excessive pain and irritation allayed, after which counter-irritation judiciously applied to the head of the hoof will be highly beneficial. One good strong vesicant will be found more efficacious than several mild ones. Sometimes very great benefit accrues from the introduction of a frog seton, and it is even claimed that a mild case may be cured by it. When properly inserted it is unquestionably of much benefit in nearly all cases. To introduce it, the frog should be cut down nearly to the quick, after which the foot should be poulticed, or kept in a warm-water bath for several days; by these means irritation will be allayed, and the foot rendered soft, so that little resistance will be offered by the tissues to the passage of the seton-needle. Where it is practicable it is better to pass the needle from above downward. This can always be done when the operator is right-handed, and is operating on the right foot of the animal. The needle should be inserted at the hollow of the heel, and brought out about one inch posterior to the point of the horny frog. In case it is the left foot that is to be operated upon, the surgeon, if right-handed, usually inserts the needle about an inch posterior to the point of the frog, and brings it out at the hollow of the heel, the object being to have the needle pass as closely as possible to the diseased structures without wounding them. In case they are wounded, the most serious results may be apprehended. The tape should be dressed occasionally with some irritant liniment, and a knot may be tied in each end of it to prevent drawing out. It should be allowed to remain in for two or three weeks, and a poultice applied to the foot every second or third day; and the frequent use of warm-water baths should be persisted in, as besides allaying irritation and rendering the horn soft and pliable, the discharge is also favoured and increased in quantity. After the seton has been allowed to remain in a proper length of time it should be removed, and the animal given a run at pasture if the ground is soft; and it should be borne in mind that a damp pasture is better than a dry one. If lameness is now found to have ceased, the animal may be shod. The shoe should have a moderately high heel, so as to prevent any undue strain being thrown upon the perforans tendon. A round shoe may be used, as frog-pressure can thereby be obtained, which is a matter of the greatest importance. However, no particular mode of shoeing can be laid down as a rule to go by, but the practitioner should try various methods, as his judgment may suggest, and the method that is found to answer best should be practised. Different animals require different methods of shoeing. If a horse is going to be used on a farm, the ordinary flat shoe will answer very well. When an animal is very lame, or has been lame for a long time, and relief cannot be afforded in any other way, it becomes advisable to perform the operation of plantar neurectomy. By means of this operation many poor sufferers, and otherwise useless animals, may be relieved of pain and made useful. The operation of neurectomy was first performed by Moorcroft and Sewell, of London, about the year 1820. As a rule it should be performed only when the animal is incurably lame. When the operation first came into notice as a remedy for obstinate foot lameness, large numbers of horses were operated upon, and as many of them were not fit subjects for the operation, it turned out to be a lamentable failure. The owners of lame animals, heedless of advice, would have it done, and the operation soon fell into disrepute. However, the successful performance of neurectomy, and the selection of proper subjects, will do the practitioner great credit. By what is known as the 'low operation,' all sensation is not destroyed, hence the 'high operation' is to be preferred, and, as a rule, is the one that is performed. By the 'high operation' is meant division of the plantar nerves above the fetlock. The situation for the incision is measured by taking as a guide the place where the nerve passes over the fetlock, and cutting down upon it about one or two inches higher up. Immediately before operating, the animal should be made to stand in cold water, or have a stream of cold water directed upon the limb from the knee downward; this will be useful to prevent an undue amount of hæmorrhage, which might otherwise take place, and by obscuring the nerve, etc., render the operation difficult. Everything being ready, the animal should be cast and secured, the foot to be operated upon should be freed from the hobbles, and held firmly extended by an assistant. A tourniquet is then fixed on. The skin is cleaned with antiseptic, and, if possible, the nerve should be exposed by one stroke of the scalpel, such a procedure being much preferable to dissecting the areolar tissue over its course. In some cases a small opening may be made with the rowelling scissors, the knife inserted, and the tissues divided from within outward. This is the least painful way. As a rule, it is best to make a good-sized incision if the practitioner is not very expert in the performance of the operation. The nerve is white and glistening in appearance, and on being pressed will give rise to a vigorous manifestation of pain on the part of the animal. By this it is known to be the nerve, and not the artery or vein. Having decided that it is the nerve, it should be raised by means of the tenaculum, and about one inch of its length excised. The first cut will give rise to severe pain, and cause the animal to struggle violently; the second cut, which should be made lower down, will be painless. After excising a portion of the nerve, the wound should be closed by means of sutures or bandages, and afterwards treated as a common wound until healed. The patient should receive careful usage for some time afterward, and great care should be exercised in shoeing such a horse to prevent pricking. The feet should also be subjected to a careful examination every night when the animal comes in, to see that they have received no injury, as the animal cannot feel any pain in the neurotomized structures, and consequently the most violent injury may occur to the foot and the horse show no sign whatever. The unfavourable results of neurectomy are suppuration, perhaps from a corn, which in a foot not devoid of sensation would have caused lameness, and been searched for, treated, and cured before reaching the suppurative stage. In some cases extensive suppuration occurs, and must be treated at once to prevent sloughing of the hoof. In other cases gelatinous degeneration of the foot follows, and may do so even when neurectomy has been performed under the most favourable circumstances, and in the most suitable case possible to select for the operation, the foot breaking or twisting off. It should, however, be borne in mind that this condition may occur even when neurectomy has never been performed, and may result from eating ergotized grasses; hence the mere fact of its occurring after the operation of neurectomy has been performed should not be received as proof absolute that it occurred in consequence of this. It is always the best plan for the practitioner, when he has concluded to operate, to explain the nature and possible results of the operation to the owner, or the latter may sue for the value of the horse in case there are any bad results. The operation is one that it is not advisable to practise to any very great extent, as it will generally cause the practitioner to become involved in trouble, unless he is very careful in the selection of his cases. Sometimes the divided ends of the nerve will reunite, and the animal remain sound, and in other cases lameness immediately appears on reunion taking place.

CHAPTER XIV

The Teeth

INDICATIONS OF AGE

The teeth are the principal agents employed in the process of mastication, but, aside from this, they are of peculiar interest to the veterinarian and to horsemen generally, inasmuch as it is by means of the various changes taking place, the marks, wearing away, etc., that the age of the horse is ascertained or approximated. For sake of description a tooth is divided into crown, neck, and fang. All the teeth are formed of three substances, as follows: enamel, dentine, and crusta petrosa. There is a cavity in the fang of the tooth, running up a short distance into the neck; this cavity is known as the pulp cavity. It contains a soft material, consisting of fibres and bloodvessels, and is largely supplied with nerves. The cavity gradually disappears as age advances, as there is more or less decomposition of dentine continually taking place. Immediately surrounding the cavity is found the dentine, which consists of twenty-seven or twenty-eight per cent. of animal matter, and seventy-two per cent. of earthy matter. Hence it is seen to be harder than bone. In the tubes which open from the pulp cavity is contained some of the pulp. The tubes somewhat resemble the canaliculi of bone, and the dentine itself, from the fact that it contains processes from the tubes, has some little power of sensibility. Dentine is developed from the pulp in the pulp cavity. As age increases it takes on a yellowish tinge, and that last developed is the yellowest. Enamel contains about ninety-seven per cent. of earthy material, and three per cent. of animal matter, hence is exceedingly hard, being, in fact, the hardest substance in the animal body. The enamel covers the dentine, and is made up of a number of six-sided rods, or hexagons, which are placed in a perpendicular position, one extremity pointed outwards, the other extremity being placed upon the dentine; these rods are not exactly straight, but have a somewhat wavy course, as have the tubes. Lacunæ and canaliculi are found in enamel, the same as in bone, but Haversian canals are absent. The crusta petrosa is found on the outside, in connection with the fang of the tooth; it is softer than either enamel or dentine, is considered to be the true bone of the teeth, and possesses lacunæ and canaliculi. The teeth are of three classes, consisting of molars or grinders, incisors or cutting teeth, and tusks or canine teeth. The teeth are wider in the upper jaw than in the lower jaw; they form two oblong or parabolic arches, and are separated by a well-marked inter dental space. The horse, like other animals, is provided with two sets of teeth, temporary and permanent. The temporary teeth are those peculiar to the young animal; they are twenty four in number, twelve molars and twelve incisors. The permanent teeth are forty in number, consisting of twenty-four molars, twelve incisors, and four canine teeth, the latter being rarely developed in the mare. On the table surfaces of the incisor teeth exist cavities known as infundibulæ, and these cavities form the principal means of arriving at a knowledge of the animal's age. Around each infundibulum there is a well-marked ring or circle of enamel. As the animal advances in age, the teeth wear down and become somewhat straighter. The temporary teeth are readily recognisable by their small size, their well-marked neck, and extreme whiteness. The permanent teeth are distinguished by being darker in colour, the absence of any well-marked neck, and their greater size. On the anterior aspect of each of the permanent incisors of the lower jaw there is a well-marked groove to be seen; the incisors of the upper jaw each possess two of these grooves. The mouth of a two-year-old horse is very similar to that of a five-year-old, the only difference being in the size and colour, presence or absence of grooves, etc., the absence of the canine teeth in the two-year-old mouth and their presence in the mouth of the five-year-old male animal. In the centre of a very old tooth may be seen a little mark just posterior to the infundibulum; this is known as the dental star. The cutting of the teeth varies to a slight extent. The foal has generally at birth twelve molars, and frequently four incisors. If the central incisors are not present at birth they appear in a couple of weeks. If the foal is carried over time they are present at birth, but if born before time they are absent. At an age varying from six to nine weeks the lateral incisors appear, at the age of nine months the corner incisors appear, and at the age of one year all of the incisors are in wear. As in the permanent tooth, so in the centre of each temporary tooth is an infundibulum, which is filled with tartar or food. One-third of the cavity wears away each year. A certain influence, however, is exerted over the wearing of the teeth by the nature of the food, and according as the food is of a hard or a soft character do the cavities decrease rapidly or slowly. The young tooth is broadest from side to side, the tooth of old age being broadest from before backward, and gradually grows narrower from side to side. For racing, show purposes, etc., foals take their age from January 1. At birth there are twelve temporary molars and four temporary incisors; if they are not up at birth, they usually appear by the fourteenth day. The lateral incisors appear from the sixth to the ninth week of the colt's age, and at an age varying from eight months to a year the corner incisors make their appearance. The first permanent molar, the fourth in the jaw, makes its appearance when the colt is about one year old; hence the colt at one year old has twelve temporary incisors, twelve temporary molars, and four permanent molars. Between the ages of one and two years the incisors remain the same in their arrangement, but wear down to a considerable extent; when the colt is about eighteen months old the second permanent molar, the fifth in the jaw, makes its appearance, and is up and in wear when the colt is two years of age.

When the colt is about two years and six months old the gums around the incisors begin to get full and round. In about three months afterwards the central temporary incisors fall out, and are replaced by permanent incisors, which are up and in wear when the colt is three years of age. At the age of two years and six months appear two more permanent molars, the first and second in the jaw. Hence at this time the colt has eight temporary incisors, four permanent incisors, and twenty molars, sixteen of which are permanent and four temporary. About the age of three years and six months the lateral incisors appear, and are up and in wear when the colt reaches the age of four years. At about this time the fifth permanent molar, being the third in the jaw, makes its appearance, and is quickly followed by the sixth permanent molar, which is also the sixth in the jaw; and at the age of four years the colt has all of his permanent molars, numbering twenty-four, up and in wear, and no temporary molars. Between four and five years of age is when the permanent corner incisors appear, and at five years of age they are up and in wear. At this period also the canine teeth appear in the male, and the mouth is complete, no further changes taking place. Hence at five years of age the horse is pronounced to have a full mouth. Occasionally a horse will be met with having a full mouth at the age of four years, but such cases are extremely rare. Sometimes the posterior borders of the corner incisors do not come up as they should. Such a condition constitutes what is known as a shell mouth. Such a mouth may very easily cause an eight-year-old horse to be mistaken for a six-year-old. The tusks, or canine teeth, make their appearance only as permanent teeth. In some cases they do not appear in the upper jaw until the animal is between five and six years old. When the incisor teeth of the upper jaw overlap, or project further forward than those of the lower jaw in such a manner that they do not meet, it constitutes a condition known as parrot-mouth, so-called from the resemblance to the beak of a parrot. At the age of six years the infundibulæ are worn entirely out of the central incisors, two-thirds worn out of the lateral, and one-third worn out of the corner incisors. At seven years old the table surfaces of the central and lateral incisors are found to be perfectly smooth, while the infundibulæ of the corner incisors may be observed to have dwindled to one-third of their original size. When the horse reaches the age of eight years the table surface of the lower row of incisors is found to be perfectly smooth, presenting no depressions whatever. About this time there may usually be observed a little hook-like projection on each of the upper corner incisors. The animal is shown by the presence of these projections to be at least seven years of age, and perhaps older. On an average the animal reaches an age of nine or ten years before the infundibulæ of the central incisors of the upper jaw become completely worn out. At the age of ten or eleven years the mark is found to be absent from the lateral incisors, and at twelve years of age the table surface of the upper row of incisor teeth is found to be worn smooth. At this age the incisors begin to project forward, broaden from before backward, and become narrower from side to side. In the mouth of every young horse we find a ring of enamel around each of the infundibulæ. The practitioner should in every case, when examining a horse's mouth to ascertain his age, be careful to note the presence or absence of this ring of enamel, as some dishonest dealers often with a gouge scoop out a hole, so as to present the appearance of an infundibulum, the deception being rendered more perfect by the application of a hot iron to the artificial depression, by which means it is given a colour similar to that of the natural depression.* But if the ring of enamel is not present we may rest assured that the depression is an artificial one, as a man, however expert or clever he may be, cannot possibly place or produce a ring of enamel around the false infundibulum. Its absence may be received in all cases as proof unquestionable that the animal is an old one. The same evidence is furnished by the presence of the dental star, which makes its appearance when the animal is about eleven years old. Other signs of age are the presence of tartar upon the teeth, and more particularly in connection with the canine teeth, which also are much longer than in a young animal, or, if short, present on their free extremity each a flat surface, looking much as though the tooth had been sawn off. After the animal has reached the age of eight years it becomes somewhat difficult to ascertain his age correctly by means of the teeth, but by practice and close observation one may become pretty proficient. There are also general indications of the advance of old age aside from those afforded by the teeth, as deepening of the hollows over the eyes, the appearance of gray hairs on various parts of the body, and more particularly about the eyes and muzzle, pendulous lips, the withers become high and sharp, the animal becomes more or less sway-backed, the space between the thighs gradually increases in size as the animal advances in age, and there is a general appearance of feebleness and decay. A crib-biter may be known by the peculiar appearance of his teeth, which are worn off on their anterior aspect. Such a horse may often deceive the best judge by a year or two. Some difficulty may also be experienced in arriving at the exact age of a horse from the fact that some colts are foaled late, and some are foaled early in the season.

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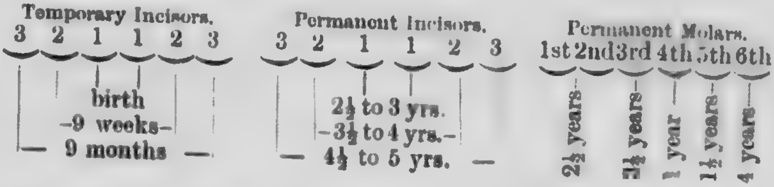
* This is termed 'bishoping.'

Cattle.—The teeth of the ox are thirty-two in number, consisting of eight incisors and twenty-four molars. The incisors present a well-marked neck, and are shovel-shaped. They are loosely placed, and are situated in the lower jaw, there being none in the upper jaw, which, instead, is furnished with a cartilaginous pad, against which the incisors of the lower jaw play. The age of the ox is usually ascertained by an examination of the horns, but when it becomes important that the age of the animal should be definitely stated the teeth should be referred to. The incisors, if not up at birth, are usually up within one month after birth. The temporary molars appear about the same time. The various changes take place sooner in the mouth of a well-bred animal, or one well kept, than in a coarsely-bred or badly-nourished animal. Hence, according to the breed, quality and quantity of food, general treatment, etc., of the animal, are the temporary central incisors shed, and replaced by permanent incisors at about one year and nine months. From six to nine months later the internal lateral permanent incisors appear, the external lateral appearing from two and a half to three years, and the corner incisors at an age varying from three years and three months to four years. The first (the fourth permanent) molar appears when the animal is about six months old, the sixth and last permanent molar being in position at the age of two years. The animal usually has a full mouth at an age varying from three to four years. The remarks made in regard to the teeth of the ox will also apply to those of the sheep, with the exception that dentition in the sheep usually occupies a period slightly shorter than that occupied by the same process in the ox.

Dog.—There has not been a great deal of attention paid to the indications of age afforded by the teeth of the dog, as generally speaking, the age of a dog is not a matter of much importance. All the incisor teeth are usually present at birth, or if not present appear in a day of two. The eyes of the pup are closed at birth, and remain so for a period varying from ten days to two weeks. At the age of five or six months the temporary teeth are shed and replaced by permanent teeth; and at the age of one year and a half dentition is usually complete. At one year of age the teeth are beautifully white and fresh in appearance, and there is a peculiar shape of the incisors, which has been likened to that of a trefoil or a fleur-de-lis. As the age of the animal progresses this appearance becomes less and less distinct until finally, about the age of two years, it can be no longer distinguished, and the teeth, particularly the lower incisors, begin to show signs of wear, which gradually increase until the teeth become blunt and worn all round, which is usually when the animal is four or five years of age. The mode of living, kind of food, etc., exert a considerable influence over the wearing away of the teeth, as it is evident that an animal fed on hard food, given bones to gnaw, addicted to fighting, etc., will have his teeth worn away much sooner than an animal fed on soft food, allowed few bones, and of peaceful habits.

The following table shows the various changes taking place in the mouth of the horse from the time of birth up to the age of five years.:



Hence the horse has—

Age.	Incisors. Temporary.	Incisors. Permanent.	Canine.	Molars. Temporary.	Molars. Permanent.
At, or soon after, birth	4	0	0	12	0
9 weeks	8	0	0	12	0
1 year	12	0	0	12	4
2 years	12	0	0	12	8
3 years	8	4	0	4	16
4 years	4	8	0	0	24
5 years	0	12	4	0	24 = 40

The table given below indicates the various changes which occur in the mouths of ruminants, and more particularly in the mouth of the ox:

RUMINANTS

	Incisors.			Molars.	
Age.	Temporary.	Permanent.	Age.	Temporary.	Permanent.
At, or soon after, birth	4	0	....	12	0
2 weeks	6	0	1 year	12	4
3 weeks	8	0	2 years	8	12
2 years	6	2	3 years	4	16
3 years	4	4	4 years ...... 5 years	0	24
4 years	2	6			
5 years	0	8			=32

A table giving the number and variety of teeth as they occur in the domestic animals and in man may be serviceable as one of handy reference, and is herewith appended:

	Incisors.	Molars.	Canine.	Bicuspid.		Total.
Man	$\frac{4}{4}$	$\frac{6}{6}$	$\frac{2}{2}$	$\frac{4}{4}$	=	32
Horse	$\frac{6}{6}$	$\frac{12}{12}$	$\frac{2}{2}$	$\frac{0}{0}$	=	40
Ox	$\frac{0}{8}$	$\frac{12}{12}$	$\frac{0}{0}$	$\frac{0}{0}$	=	32
Dog	$\frac{6}{6}$	$\frac{12}{14}$	$\frac{2}{2}$	$\frac{0}{0}$	=	42
Pig	$\frac{6}{6}$	$\frac{14}{14}$	$\frac{2}{2}$	$\frac{0}{0}$	=	44
Cat	$\frac{6}{6}$	$\frac{8}{6}$	$\frac{2}{2}$	$\frac{0}{0}$	=	30

The dental formula of the ox is the same as that of all ruminants.

DENTITION FEVER

When the permanent teeth are making their appearance, there is often a considerable amount of irritation caused thereby. In children a similar irritation is caused by the cutting of the deciduous teeth, but the appearance of the temporary teeth in animals is very rarely attended with any pain or inconvenience whatever, irritation seldom occurring except in connection with the cutting of the permanent teeth. This irritation may be noticed at any time when the animal is between the ages of one and five years, and has received the name of dentition fever.

Symptoms.—The animal may or may not eat pretty well, often cuds his food, and wastes more or less of it. The gums, on being examined, are found to be reddened by an excess of blood, swollen, and very tender. The irritation may extend to, and cause a slightly deranged condition of the stomach and bowels, giving rise to constipation, diarrhœa, etc. These symptoms, taken in connection with the fact that the animal is between one and five years of age, afford conclusive proof that the irritation is caused by the process of dentition. The same remarks will apply to cattle between the ages of one and three years.

Treatment.—The mouth should be thoroughly examined, and if it is found, which is frequently the case, that a temporary tooth is not being shed in a proper manner, and is interfering with the movements of the permanent tooth beneath it, whether incisor or molar, it should at once be removed. In many cases it can be removed with the thumb and forefinger. When its removal cannot be effected in this way, forceps should be used. It is rarely necessary to cast the animal, but in the case of a very irritable animal, or one that offers much resistance, it must be done. It will also in many cases be found necessary to use a balling-iron, or mouth speculum, Grange's probably being the best instrument for the purpose. The late Mr. House, however, who was very expert and dexterous in the performance of all operations in connection with the teeth, rarely used a balling-iron. The after-treatment consists of the administration of a dose of laxative medicine if the bowels are constipated, whilst the food of the animal should be soft, of a laxative and nutritious character, and an abundance of pure cold water should be allowed.

Sharp and Projecting Teeth.—As a horse advances in age the teeth usually wear down in an irregular manner, the molars of the lower jaw become sharp and projecting on their inner aspect, and during the process of mastication interfere to a greater or less extent with the tongue, even in some cases causing considerable laceration of that organ. The same condition is observed in connection with the molars of the upper jaw, with this difference, that the projections, instead of being on the inner side, are found on the outer aspect of these teeth, and cause soreness and more or less laceration of the cheeks, more particularly during the process of mastication. The condition is oftenest seen in connection with the first molar of the upper jaw, and the sixth molar of the lower jaw, the latter setting up the most irritation. The animal will refuse to eat rather than suffer the pain caused by masticating his food, the latter being cudded and dropped into the manger. Sometimes he will scarcely eat sufficient to sustain life, as a result of which he becomes so greatly emaciated that in many cases he might fittingly be described as a walking skeleton. A searching examination, however, reveals no signs of disease. The pulse, both as to its character and number of beats, the temperature, etc., is found to be normal, but on passing the finger into the mouth the teeth are discovered to be sharp and projecting on their sides, and on examining closer the tongue and cheeks are seen to be sore and lacerated. The mouth speculum may be necessary in some cases when it is desired to make a thorough examination of all the molars. The animal does not drive as kindly as usual, being slow to answer the rein, and may while travelling carry his head on one side, and is hard to keep straight in the road, showing a tendency to gradually work over to the right or left.

Treatment.—The condition being discovered to exist, the remedy is at once made apparent. It is evident that the sharp projections must be removed before the animal can obtain relief. The best instrument for this purpose is the tooth-rasp. The teeth should be rasped until smooth, and the animal fed for a day or two on soft food; nothing more is necessary.

Abnormally Long or Projecting Teeth.—These are most frequently seen in consequence of congenital malformation of the jaws. It is a very common condition, and occurs most commonly in connection with the first molar tooth of the upper jaw and the last molar tooth of the lower jaw. It constitutes a more serious condition than the one previously described under the head of Sharp and Projecting Teeth, and more especially is this the case when the sixth molar of the lower jaw is the one at fault It gives rise to quidding of the food, imperfect mastication, loss of condition, etc. A projecting tooth is one that grows longer than its fellows on account of the opposing tooth immediately under or over it becoming carious or having been extracted, in consequence of which the tooth, meeting with no resistance, grows out longer than is natural, and causes much pain and irritation, which increase as the tooth increases in length, until it becomes no longer possible for the animal to masticate his food, great emaciation takes place, and, unless relieved, the animal eventually dies, or has to be destroyed.

Treatment.—The condition having been discovered, it becomes necessary to remove the projecting portion of the tooth, and reduce it to a level with its fellows. Gowing's tooth-chisel is a very good instrument for the purpose, but Thompson's tooth-shears are better. If the above-mentioned instruments fail, the projecting portion of the tooth may be crushed off by means of the ordinary molar tooth forceps, after which the ragged edges left by the forceps should be removed by rasping the tooth until it is rendered smooth. A tooth-chisel and wooden mallet are sometimes used, but unless the patient is anæsthetized, the process is very barbarous, and the shock to the system has been known to cause death. The after-treatment consists of feeding the animal on soft food for a day or two, and in the course of ten days or a fortnight he will improve to such an extent as to be scarcely recognisable as the same animal seen a week or two before. In some cases there are present as symptoms a nasal discharge which may or may not be fetid, and a dribbling of saliva from the mouth.

CARIOUS TEETH

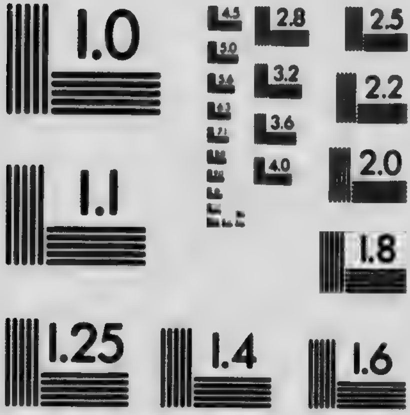
Caries of the teeth is characterized by gradual decay or breaking down of the tooth substance in small particles by the ulcerative process. It is not very common, but is met with in connection with the fourth molar, this tooth being more frequently affected than any of the other teeth, although none of the teeth are exempt from an attack of caries, even the incisors occasionally becoming affected; however, such cases are very rare. Caries may commence in the neck, crown, or fang. It is by no means as common among the lower animals as it is in the human race, and among people is more common on the American continent than in Great Britain, the explanation of which is said to lie in the fact that the mode of living in Great Britain is so different to the mode of living in America, where the people are much addicted to eating sweets, etc., which exert a prejudicial effect on the teeth.

Causes.—Caries is due to certain micro-organisms, which gain entrance after injury to the outside enamel. The latter is usually caused by taking into the mouth with the food some hard substance, as a pebble, piece of iron, etc., which during the process of mastication comes into contact with the tooth, breaks the enamel, and caries quickly follows. A severe blow on the lower jaw might also produce caries, and often it occurs without any appreciable cause, and may exist for a considerable length of time before giving rise to any well-marked symptoms.

Symptoms.—It may be observed occasionally that the animal has some difficulty in masticating his food, and frequently while eating will suddenly stop and throw up his head as though feeling a sudden twinge of pain, perhaps ejecting a portion or the whole of the food contained within the mouth at the time. The animal may make a constant practice of what is termed 'quidding his food'; there is usually an increased flow of saliva; the mouth is carelessly examined, and nothing is discovered to be wrong. However, the most careful examination sometimes fails to reveal the seat of the trouble. As the disease advances the bone gradually becomes involved, and a slight enlargement is usually observable externally in consequence of the irritation extending to, and causing swelling of, the soft tissues immediately over the region of the diseased tooth. Pressure upon or tapping this enlargement will usually give rise to some manifestation of pain, and on passing the hand into the mouth and carefully examining each tooth by pressing and tapping upon it, when the affected tooth is reached, the animal will usually evince more or less pain. In a short time other and plainer symptoms become apparent: the bone and soft tissues in the neighbourhood of the diseased tooth become affected, and give rise to a discharge which renders the breath of the animal horribly offensive, the odour of a carious tooth being much worse than that of any other carious bone. The discharge takes place into the mouth when the affected tooth is one of the lower jaw, there being no nasal discharge except when the tooth affected is situated in the upper jaw; in such a case there is always a nasal discharge more or less profuse

MICROCOPY RESOLUTION TEST CHART

(ANSI and ISO TEST CHART No. 2)



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in quantity, and possessed of a very offensive odour. When the fang of the tooth is the portion affected, the tooth sinks in its socket, and on examination its table surface is found to be much lower than the table surfaces of the other teeth, and it may be loose in its socket and easily moved about with the finger and thumb, but still a strong pull with the forceps will usually be required to remove it. A carious tooth will often give rise to nasal gleet, the animal losing flesh, becoming dull and dejected, and suffering greatly from toothache. The nasal discharge may be from one nostril only, and the submaxillary glands may be affected to a certain extent. Such symptoms might lead the practitioner into the mistake of supposing it a case of glanders, and many an animal with nothing more serious than a carious tooth has been destroyed under the impression that it was a case of glanders. Occasionally, when the diseased tooth is one of the molars of the upper jaw, it will work its way back into the frontal sinus.

Treatment.—The only method of affording relief to the animal is removal of the tooth. In some cases this is found to be a matter of considerable difficulty, especially if it is the fifth or sixth molar that is diseased, and the tooth is sunk in its socket, in which case it is difficult to grasp it securely with the jaws of the forceps. The key is sometimes used, but there are far better instruments in the shape of Santy's or Gowing's tooth-forceps. They must be used carefully, as otherwise the tooth may be crushed or broken off, and its subsequent extraction rendered difficult. Occasionally a tooth may be met with which the forceps are unable to grasp; such cases, however, are very rare. In all cases where a molar tooth is to be extracted it is advisable to cast the animal; and when it is desired to remove the third molar or any of those posterior to it, casting becomes absolutely necessary for the proper performance of the operation. Having cast and secured him, a balling-iron or mouth speculum must be used to keep the mouth open, and allow the operator to see what he is doing. The affected tooth being found, the jaws of the forceps should be placed over it and tightened, the operator being careful not to crush the tooth, and also seeing that none of the soft tissues are grasped by the jaws of the forceps. The tooth should be extracted by a steady pull or turn of the forceps, all jerking being avoided as likely to break it. After the tooth is extracted, the balling-iron should at once be removed from the mouth and the animal allowed to rise, and have his head in its natural position, as in case there is any considerable hæmorrhage some of the blood might otherwise escape into the trachea and cause serious results.* If after an examination it is thought that the tooth cannot be extracted by means of the forceps alone, it becomes necessary to cast the animal, divide the soft tissues over the region of the tooth, trephine, and punch the tooth out, or at least dislocate it, using a good strong steel or iron punch for the purpose, and a wooden mallet to strike the punch with will also be found preferable to one of metal. Having loosened the tooth in its socket, its further removal may be accomplished by means of the forceps. In case a tooth be broken in an endeavour to extract it, the animal should not be kept down too long in the hope of extracting the stump, but should be allowed to rise, and no further attempt made for a month or six weeks, when, as a rule, the remaining portion of the tooth will come away of its own accord. If the practitioner becomes satisfied that the remaining portion will not come away unless extracted, he should endeavour to effect its removal by the forceps in the same manner as before. The after-treatment consists of feeding with soft food for a few days, in addition to which the cavity remaining after extraction of the tooth should be frequently examined, as small portions of hay, etc., may become lodged within it and set up irritation, in which case it may be necessary to fill it with gutta percha ; but, as a rule, nothing of the sort will be required. One serious objection to the operation of trephining and punching out the tooth is that the food is likely to get into the opening and cause considerable irritation and possibly a fistulous opening.

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* The fear of this renders the use of chloroform or other general anæsthetic a matter for serious consideration before extracting posterior molars from the horse or other large animal when it is cast upon the ground.

PARROT MOUTH

This condition has been spoken of before when treating of the indications of age, as furnished by the teeth. In parrot mouth the incisors of the upper jaw project further forward than those of the lower jaw, and instead of meeting them overlap so that when the mouth is shut the upper incisors pass down in front of those of the lower jaw, and these latter, when long enough, reach to and press upon the bars or roof of the mouth, in consequence of which considerable irritation may be caused. A horse with this deformity does very badly at pasture, being unable to gather a sufficient quantity of food to maintain himself in good condition, and nearly always loses flesh when placed on pasture. The deformity, however, does not appear to cause the animal much inconvenience when feeding from the manger, except when fed on unshelled Indian corn, in which case he experiences considerable difficulty in getting the grain off the cob.

HOG MOUTH

This condition is exactly the opposite of the parrot mouth, the lower jaw projecting beyond the upper. If very much exaggerated it constitutes quite as severe a defect as a parrot mouth.

Collection of Tartar. — Lumps of tartar sometimes collect on the teeth and sometimes attain a very large size. They render the process of mastication very difficult, and at the same time give rise to a considerable amount of irritation.

Treatment.—All that is necessary is the removal of the enlargement, using the tooth-shears or rasp for the purpose.

Dentigerous Cysts. — Abnormally displaced teeth may be discovered in almost any organ of the animal body. They have been found in the testicles, on the superior maxilla, within the sinuses, and in the petrous temporal bone at the root of the ear. The substance may have the form and appearance of an incisor, or it may be large and bear a very close resemblance to a molar tooth. It may be suspected in the testicle by an abnormal hardness, or it may only be discovered after contraction. Under the ear its presence is detected by a swelling which appears like an abscess, is lanced, or bursts, and discharges a glairy fluid. In a few weeks the swelling reappears. A permanent cure can only be attained by operation.*

Wolf-teeth.—Wolf-teeth are those small supernumerary teeth which make their appearance just anterior to the first molar, and are popularly supposed to cause serious disorders of the eye, and even blindness; but as a general thing they do no [illegible]. In rare cases they may possibly cause a very slight irritation of the eye. If it is desired to remove them, a small pair of forceps should be used for the purpose.

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* *Journal of Comparative Pathology and Therapeutics*, vol. xiii., p. 174.

CHAPTER XV

Injuries, etc., in the Region of the Mouth

The lips are sometimes lacerated; the treatment is the same as though the wound had occurred in any other part: as little tissue as possible should be removed, the parts brought together by means of sutures, and an antiseptic lotion used daily.

Abscesses. — Abscesses sometimes occur in connection with the lips, and more particularly in connection with the upper lip, as a result of a bruise of the part, or the presence of a foreign body, as a thorn or splinter in the lip; or it may be caused by coming into contact with poisonous weeds, etc. The symptoms are the same as those presented by an abscess in any other part of the body, as pointing, fluctuation, etc.

Treatment.—At the proper time the abscess should be opened, and its contents allowed to escape, after which it should be cleansed with tepid water, and dressed daily with an astringent or anodyne lotion.

Frænum Linguæ, Injury of.—The frænum linguæ may be injured by violent pulling against the bit, suddenly checking the animal, and, probably the most common cause of all, by roughly holding the tongue when giving a bolus. A foreign body may cause a great deal of irritation, and may obtain entrance in a very simple way; for instance, while a horse is eating barley straw, a bit of the straw may become lodged in the frænum linguæ, and in due course of time set up considerable irritation. In some cases the frænum may be lacerated or torn completely through.

Treatment.—If necessary, the parts may be cleansed with tepid water, after which a solution of potassium chlorate should be used on the wound once or twice daily; carbolic acid, alum, chinosol, or other antiseptic lotions should be applied frequently after the mouth is cleansed, and the animal should for a time be fed on soft food.

TUMOURS AND INFLAMMATORY GROWTHS OF THE MOUTH

Growths in the mouth, usually seen in connection with loose or injured teeth, are not uncommon in the horse and dog. Some are of a malignant nature, being either sarcomatous or carcinomatous in structure. Carcinoma, or true cancer, is a comparatively rare disease of the lower animals, and out of all the exceedingly numerous pathological specimens examined in the laboratory of the London Veterinary College during several years Professor McFadyean only discovered sixty-three cases.* Sarcomas are more common, especially in the dog, and, being very malignant, are very troublesome to cure permanently. Free excision under an anæsthetic, with careful curetting, temporarily saves the patient, the wound being frequently cleansed with antiseptics. Fibromas are usually seen at the root of a canine or incisor, and often have a good pedicle. They can be removed either with a sharp hot-iron, a ligature, or the knife itself, the wound being kept clean afterwards. Inflammatory growths usually occur in conjunction with loose teeth. The latter must be removed and the mouth dressed with astringents. If the animal seems in pain, and if, after careful excision the growth reappears, the patient should be destroyed as speedily and painlessly as possible.

Papillomas or warts in the mouth of the dog often cover the tongue and buccal membrane. They are contagious, and can be transmitted from dog to dog by contact of a wart with the slightest wound of the mucous membrane of the mouth. This has been proved experimentally.* If the blood from a wart comes in contact with a raw surface in the mouth a fresh wart will form in about three or four weeks. The safest method of removal is by ligature, excising them after several days. If left alone, warts of the mouth disappear spontaneously in about two or three months.

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* *Journal of Comparative Pathology and Therapeutics*, vol. xii., p. 139.

LAMPAS

This name is given to a congested state of the gums behind the incisors, the irritation extending in some cases back to the palate. It is of most frequent occurrence in animals between the ages of three and five years. In a genuine case of lampas, the gums and often the palate become inflamed and swollen, an infiltration of serum takes place into the sub-mucous tissue, and the gums extend downward until on a level with the table surfaces of the teeth, and in many cases descend below the level of the table surface of the upper row of incisors, and interfere to a considerable extent with the taking of food into the mouth—particularly food of a hard character, as corn on the cob. The process of mastication is also more or less interfered with. On examination of the mouth, the gums and palate are seen to be unnaturally reddened and swollen, the animal evinces pain when the parts are pressed upon, and shows a decided objection to having the parts examined. In many cases horses are met with having naturally very prominent gums, etc., but such do not constitute the condition known as lampas, as, on examination, it will be seen that there are no signs of inflammation or pain ; the gums present no unnaturally reddened appearance, and the condition evidently is a natural one.

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* McFadyean and Hobday, *Journal of Comparative Pathology and Therapeutics*, vol. xii., p. 341. Penberthy, *ibid.*, p. 363.

Treatment.—If considered absolutely necessary, the congested palate may be slightly scarified. To obviate danger of wounding the palatine artery, all of the incisions should be made anterior to the third bar. The incisions may be many or few, according to the judgment of the surgeon; but in all cases they should not be deep. A very common practice is burning the parts with a hot iron. It is a very barbarous mode of treatment, and one that should not be countenanced. Astringent and cooling lotions are very useful, both before and after scarification; the ordinary white lotion may be applied occasionally, or a solution of alum in the proportion of alum ʒii.—℥ss. to a pint of water may be applied frequently. The animal should be given a saline aperient, and in most cases this is all that is necessary. The food should be of a soft and nutritious character—avoiding everything harsh, as Indian corn, and he should not be driven for a few days, as the presence of the bit in the mouth will keep up irritation.

WOUND OF THE PALATINE ARTERY

Wound of the palatine artery may occur in various ways, but the most common cause of this wound is the jack-knife in the hands of ignorant men, who make a practice of bleeding in the mouth for the cure of every ill to which horse-flesh is heir. The hæmorrhage is very profuse and alarming in some cases. In all probability, in the case of a strong animal, it would not continue for a length of time sufficient to cause death; but a horse in a debilitated condition would be very likely to bleed to death if the wound of the artery was a large one.

Treatment.—Sometimes, on account of the intractability or restlessness of the animal, it becomes a matter of considerable difficulty, or even an impossibility, to get at the wound or check the hæmorrhage without casting the animal; in some cases, having the mouth held open by means of some simple arrangement (generally a speculum can be used), and the head steadied by an assistant, the surgeon may try the effect of a suture or two. In rare cases, the hot iron may be used; but the nicest and most successful way of checking the hæmorrhage is by pressure applied by means of a pad of wadding or tow wrapped round with a towel or bandage, the head being tied up as high as possible.

INJURIES TO THE TONGUE

The tongue may suffer injury in a great many ways, as by sharp and projecting teeth, by the action of a very severe bit, the careless application of a noose over the premaxilla; pulling back suddenly, and perhaps lacerating the tongue with the teeth. The practice of certain people who pull the tongue violently, or grasp it roughly, bringing it as far out of the mouth as possible when administering a dose of medicine, is a very prolific source of injury to the organ; falling down when the tongue is protruding; the administration of irritant medicines insufficiently diluted; india-rubber rings have been discovered on the tongue both of horse and dog, cutting them nearly in half. Balling with a stick may sometimes cause a serious and often a pretty extensive wound in the tongue. Foreign bodies may also become lodged in the tongue, giving rise to an increased flow of saliva, constant motion of the organ, more or less difficulty in mastication, swallowing, etc.

Treatment.—The practitioner should make a thorough examination of the tongue with the hand, and having found the offending agent, remove it in the usual way, using the knife if necessary: astringent lotions, etc., should be applied, and if there is a wound or fetid odour antiseptic lotion should be used. A nice application in such cases is as follows: Alum ʒi., Mellis ℥iv., Aquæ Oi to be applied as often as may be deemed necessary. Sometimes a foreign body becomes lodged in the space beneath the tongue, and situated pretty well back. In such cases there will be an immoderate flow of saliva, which runs out of the mouth, constant motion of the tongue, quidding of the food, and generally the head is poked out. On an examination no signs of influenza or sore throat are discoverable. Examine the parts carefully, and having found the piece of wood or other foreign body, it should be removed without delay.

GLOSSITIS

Glossitis, or inflammation of the tongue, is a condition not infrequently met with; it is usually caused by injury, such as by the action of a severe bit, pieces of wire or needles, rubber rings, string tightly tied round, mastication of irritant or poisonous substances, the incautious administration of some medicines, as chloral, ammonia, turpentine, etc., when not properly diluted.

Symptoms.—There is an increased flow of saliva into the mouth, from which it is in turn again discharged; the appetite may be more or less impaired, according to the intensity of the inflammation. The process of mastication is rendered impossible in many cases, or, where possible, can be performed only with very great difficulty and pain. The power of deglutition is in all cases more or less impaired, and frequently is lost altogether; the mouth is usually kept in a partially opened state, the tongue may be seen to be much reddened and is hot and tender when touched. There is always more or less swelling. In some cases it is swollen to such an extent as to seriously interfere with respiration, and endanger the life of the animal. The mucous membrane may be removed in patches. As a rule, the throat does not become involved to any serious extent; frequently the tongue, red and swollen, is allowed to hang out of the mouth. When recovery takes place, the tongue soon regains its normal appearance. When induration occurs as a result of glossitis, the swelling subsides, and cracks appear extending transversely across the tongue, which on being felt is found to be hard and unyielding. When this condition occurs, generally speaking, the tongue can never be restored to its natural condition, and the animal gradually loses flesh, and occasionally dies, death being in such cases really due to starvation.

Treatment.—Endeavour to find out the original cause of the trouble, and if the inflammation has been produced by the administration of ammonia or any other alkaline irritant, the treatment should consist of acid gargles, as vinegar, etc.; if the irritation is found to be due to the administration of an acid, alkaline solutions should be used, with the view of neutralizing any acid that may still be present, and antagonizing and removing the effects already produced. In cases due to causes other than the administration of acids or alkalies, alum, honey, potassium chlorate, etc., will each be found of great service to cool the parts and allay irritation. If there be much swelling present, the tongue should be scarified and bathed with tepid water afterwards. If the swelling interfere with respiration, it may become necessary to perform the operation of tracheotomy. In case suppuration occurs, it should be treated in the ordinary way, and as though occurring in any other part of the body. In the event of induration of the tongue, the various preparations of iodine (potassium or mercuric iodide) may be tried; they may be administered internally and applied to the tongue in the form of iodine lotion, but as a rule, if induration has proceeded very far, the animal drags out a miserable existence, gradually loses flesh, becomes more and more emaciated, and finally, after lingering for a considerable length of time, dies of starvation. Where there is much fever, febrifuges are to be administered, refrigerants and diuretics will also be found to be of considerable service, and a moderate dose of cathartic medicine may be given with great benefit in some cases. If the animal shows any desire to eat, he should be allowed plenty of soft food or gruel, and an abundance of pure cold water to drink.

Epulis is the name given to a tumour in connection with the gums. It occurs in the malignant and benign forms, between which it is a matter of considerable difficulty to distinguish. Its exciting cause is irritation of some kind.

Treatment.—Complete extirpation with the knife gives the only prospect of cure, but if of the malignent variety it is likely to reappear.

Tongue, Paralysis of.—Paralysis of the tongue may be due to some brain trouble, or may be caused by lolling the tongue, or allowing it to hang out of the mouth during cold weather, in consequence of which it may swell and become powerless—the animal being unable to retract it. This condition may also be caused by rough usage, as pulling it forcibly out of the mouth when administering a dose of medicine.

Treatment is, as a rule, unsuccessful, except in cases where it is due to direct injury. Replace the tongue within the mouth, and retain it there by the application of a noseband sufficiently tight to keep the mouth shut for a few hours. Nerve stimulants, particularly nux vomica and strychnine, should be persevered in for some continuous time.

Lolling.—Lolling cannot be considered as a disease; it is a habit, and a very ugly one. It consists of allowing the tongue to hang loosely out of the mouth, and it dangles about in every direction when the animal is travelling. It may be prevented, and the animal sometimes broken of the habit, by using a bit with a high centre, or, what is better, the application of a nose-band, which should be tight enough to prevent the opening of the mouth, and consequent escape of the tongue.

ACTINOMYCOSIS

This disease is due to the attack of vegetable parasites known by the name of 'actinomyces.' It most frequently occurs in connection with the jaw-bones and tongue of the ox; it has also been observed in the horse and other animals, and even in man.

Symptoms.—Usually the first symptom to attract attention is the animal feeding badly; the irritation of the tongue frequently causes the patient, after a fruitless attempt at mastication, to eject the food from the mouth, and also gives rise to a profuse flow of saliva. A peculiarly disagreeable odour of the breath may often be detected. These symptoms having led to an examination of the mouth, the tongue will be found more or less enlarged, indurated, and tender to the touch. The swelling of the tongue may exist in circumscribed patches, or generally, and the presence of nodules of a yellowish colour, and varying in size from slightly larger than a pea to very nearly the size of a pigeon's egg, may be detected. Ulcers, circumscribed in extent and of merely superficial depth, are also to be seen at a certain stage of the disease. As the disease progresses, prehension and mastication become more and more difficult, and finally impossible. All the other symptoms mentioned become better marked, and unless relief be speedily afforded the patient succumbs, dying literally of starvation. In a majority of cases the tongue alone is affected; but in other cases, and in cases where the disease is allowed to proceed, the glands of the throat and bones of the jaw become affected, the teeth become loosened, and great emaciation takes place before death results. The condition has been sometimes mistaken for epulis, or an affection of a tuberculous character; but in cases where any doubt exists as to the nature of the malady, it can at once be dispelled by subjecting a portion of one of the nodules to a microscopic examination. In actinomycosis the characteristic fungus of the disease may be found.*

Treatment.—Owing to the researches of Professor Thomassen, of the Utrecht Veterinary College, the treatment of actinomycosis in cattle has become revolutionized during the past few years. It is now curable in the majority of cases, even if the disease has already become far advanced. Potassium iodide, or the biniodide of mercury may practically be regarded as specifics, the former in particular, but on account of its expense the latter is more frequently tried first. For cattle the dose is from 1 to 4 drachms, this being dissolved in water, and administered twice a day regularly. In a very few days a perceptible improvement can be noticed, and, as a general rule, a cure is effected in about two or three weeks. In feeding stock it is a wise plan to fatten them as quickly as possible, because a relapse sometimes occurs, although the readministration of the potassium iodide will again check the disease. The substitution of biniodide of mercury for the more expensive potassium iodide was first suggested by Professor Edgar, F.R.C.V.S., who obtained successful results from grs. ii. to grs. iv. doses dissolved in water by the aid of grs. x. or grs. xii. of potassium iodide, and administered twice a day. The biniodide does not produce its effect quite so rapidly as the other drug, and the patient must, of course, be kept under observation at intervals, as, indeed, must any animal (especially bovines) when mercurial preparations are used. There need, however, be no fear as regards using it with ordinary discretion.

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* To do this a section should be cut and stained by the Ziehl-Neilson method to show up the 'clubs.' Gram's method answers well for ordinary purposes. The parasite looks like a number of clubs or rods arranged in the form of a star radiating from a common centre. From its shape it is known as the 'ray fungus.'

Before these specifics were discovered, iodine or iodized phenol were highly recommended for local application after free scarification of the tongue; and a still more painful and barbarous method of procedure which was said to bring success consisted in rubbing the tongue until raw with a brick, and afterwards applying strong sulphuric acid. If the ordeal was not made too severe the patient frequently recovered from the disease.

PAROTITIS

Parotitis consists of inflammation of the parotid gland, and is not infrequently seen in connection with strangles, but may occur as an independent disease.

Causes.—Very tight reining may cause parotitis, and any injury to the gland, as blows, etc., may be followed by an attack.

Symptoms.—An enlargement is noticed over the region of the gland, extending from the base of the ear to the angle of the jaw; the enlargement is found on examination to be hard and hot, and pressure upon it causes the animal to evince pain; mastication may be interfered with to a very slight extent. In due course of time suppuration generally takes place, when the gland is found to be soft and fluctuating; the hair is easily rubbed off or pulled away with the fingers, the skin beneath presents a smooth and shining appearance, and signs of pointing are very apparent. In other cases suppuration does not occur, but an exudate is thrown out, and the gland becomes indurated. The exudate in course of time may, or may not, be removed by absorption, induced or assisted by the proper use of medicinal agents. Parotitis is of more frequent occurrence among young than old animals.

Treatment.—The treatment consists of the employment both of local and constitutional remedies. Fomentations ease pain and aid in the ' pointing ' of the abscess. Poultices are also highly useful, and a judicious use of liniments, and perhaps a vesicant, will be necessary if the swelling cannot be dispersed, and suppuration takes place. At the proper time the parts must be opened, and the pus allowed to escape. Such a procedure is far preferable to allowing the abscess to burst of its own accord. The lancet being plunged in, the pus will sometimes spurt out several feet. If the animal be restless, a twitch should be placed on his lip to keep him quiet. After opening the abscess, it should be nicely cleansed with tepid water, and antiseptics applied; febrifuge medicine and tonics should be given if necessary, combined with good, nourishing, soft food. If induration occurs, benefit will result from using the iodine ointment, potassium iodide being given internally. A strong vesicant often acts very efficaciously.

FISTULA OF THE PAROTID DUCT

Fistula of the parotid or Steno's duct sometimes occurs in connection with strangles. If the abscess of strangles makes its appearance close to the duct, it is well to exercise a certain amount of care in opening it, or a fistula may be formed. The presence of salivary calculi in the duct will also cause fistulous openings into the duct.

Symptoms.—A discharge of a clear watery fluid takes place from the opening in the side of the cheek; this discharge is largely increased in quantity, and is most abundant, during the process of mastication. An astonishing quantity of saliva will be thus lost, in ten or fifteen minutes the ground under the animal often being covered with the discharge. Immediately after the animal has finished his meal is when the discharge is least abundant, and at this time it may cease altogether for a short time. The immense loss of saliva interferes to a very serious extent with the process of digestion, and the animal soon becomes subject to frequent attacks of colic and indigestion.

Treatment.—All treatment must be directed to arresting the discharge of saliva through the fistulous opening, which must, if possible, be closed. If due to ulceration, in connection with an abscess, an astringent should be used upon the parts, and it will generally close in a short time. Another plan, highly thought of, and practised by a great many surgeons, is to paint the parts with collodion. The edges of the opening may occasionally be touched with silver nitrate. In some cases it becomes advisable, in consequence of the immense waste of saliva, to make a counter opening into the mouth. The best of all methods, probably, is to scarify the edges of the opening, bring them together, and paint them with several coats of collodion, and await results; in the meantime giving for a couple of days very little, or no food. If food is given, it should be gruel, or oatmeal, etc., solid food of no kind being admissible, as such has a tendency to greatly stimulate the flow of saliva. An old case of fistula of this duct is very troublesome to cure, and frequently cannot be cured at all. In cases where the above methods of treatment have been tried and failed, the parotid gland has been destroyed by injecting into its substance the following: silver nitrate ʒi., nitric acid ʒi., water ℥i., but this drastic course must not be resorted to except under extreme necessity.

SALIVARY CALCULI

Calcareous deposits may form in any actively secreting gland, or the duct in connection with the gland. Calculi are met with perhaps more commonly in connection with the parotid duct than any other. These calculi originate in the gland, pass down into the duct along with the fluid secreted by the gland, and, having reached the duct, they stop, gradually increase in size, and intercept the flow of saliva. The duct becomes enlarged, the passage of the secretion is rendered difficult or impossible, and unless the obstruction passes down and out, either of its own accord, or in consequence of manipulation, a fistulous opening is soon formed. In the majority of cases there is something that serves to form a nucleus around which the calcareous matter is deposited; a portion of food may serve for this purpose.

Treatment.—Unless of large size, the calculus may be removed by manipulation in a great many cases. Where manipulation fails in consequence of size, etc., it should be cut down upon with a knife and removed, the opening closed by suture and treated as an ordinary wound.

PTYALISM

Ptyalism is the term applied to a condition characterized by an excessive secretion of saliva. In some cases the secretion is enormously in excess of the normal quantity, and in such cases interferes to a considerable extent with the digestive process. If the flow of saliva is but slightly increased, however, no bad results are likely to occur.

Causes.—The causes of ptyalism are not always sufficiently apparent; however, we know that anything that will excite or stimulate the salivary glands will produce ptyalism. Mercury will do this, and certain kinds of food also have the power of increasing the flow of saliva—herbs and clover of certain varieties—hence the condition is most frequently seen during the summer season. In some cases the increased flow of saliva may be due to the presence of a foreign body in the tongue, or somewhere in the mouth, so that a careful examination should always be made. Such an examination may be dispensed with in cases where the surgeon is called and finds half a dozen or more horses suffering from ptyalism, as the chances are largely against each of them suffering from some foreign body in the mouth. Still, the careful observer will not fail to give each animal a separate and thorough examination.

Treatment.—If possible, the practitioner should ascertain the exciting cause; having done this, it is afterwards to be guarded against. The mouth may be washed with cold water and astringent washes, as a solution of alum, ordinary vinegar, etc. The food of the animal should be changed and a few doses of tonic medicine may be given. It is a condition, as a rule, that is easily controlled.

STOMATITIS

This name is given to an eruption which takes place on the tongue and mucous surface of the lips. It is most commonly seen in horses, and one variety of it is very contagious, being readily communicated from mouth to mouth by means of the bit, halter-rope, or anything which comes into direct contact with the affected parts.

Symptoms.—The first symptom to attract attention is a reddened condition of the parts. Little vesicles are now formed, and the mouth is found to be hot and tender. Pyrexia, both general and local, is more or less marked, but, as a rule, the pulse is not affected to any great extent. The appetite is impaired or wholly lost, and there is more or less difficulty in performing mastication. The disease may assume a contagious form, but this is not often seen in horses in England.* It is generally due to faulty digestion, feeding on bad food, musty hay, or any description of food not fitted for digestion.

Treatment.—As a rule, this condition is easily overcome. The food of the animal should be changed immediately, the bowels may also be gently acted upon by an oleaginous draught containing a little gentian and sodium carbonate. A dose of salts will be found of great benefit. Antiseptic and astringent gargles should be used. Alum, zinc sulphate, chinosol, chlorate of potash, or creolin lotions answer well. After the acute symptoms have subsided, the animal is frequently very weak. Tonics should be then used, as gentian in combination with sodium carbonate. Quinine sulphate is highly beneficial, and may be given in doses of ʒi.; if given in a bolus there should be added a few drops of dilute sulphuric acid to favour its solution. Quantities varying from grs. ii. to grs. v. may be given hypodermically producing as good an effect as ʒi. given by the mouth. Some French veterinarians are very much in favour of injecting it into the trachea, using an ordinary hypodermic syringe for the purpose.

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* In South Africa a form of contagious stomatitis was found to be troublesome amongst some of the troop horses during the Boer War of 1900-1902.

LACERATION OF THE SOFT PALATE

Intense inflammation may exist in the soft palate in consequence of injury. A very frequent cause of injury to this membrane is the reprehensible practice, persisted in by some people, of giving a bolus on the end of a stick, instead of using the hand for the purpose. Cases have occurred in which animals worth hundreds of pounds have been lost in consequence of injuries inflicted by a stick whilst administering a bolus.

Symptoms.—The animal has great fever and is much prostrated, both in strength and spirits; the appetite is completely lost; swelling takes place in the neighbourhood of the injury, and in a short while it is noticed that the breath is fetid.

Treatment.—Steam the nostrils to allay irritation, and treat about the same as a case of pharyngitis; use antiseptics (such as chinosol or boric acid) to the mouth, and give stimulants and tonics internally. The diet should be soft and laxative.

CHAPTER XVI

Injuries, etc., in the Œsophageal Region

PHARYNGEAL ABSCESSES

Abscesses in connection with the pharynx occur in the horse, but are of more frequent occurrence among cattle, and are generally found to exist in connection with some tuberculous disease, and also as a result of the presence of the actinomyces fungi.

Symptoms.—Difficult breathing, during respiration a wheezing sound is given out, deglutition is rendered very difficult, and when pressure is brought to bear over the region of the abscess, the wheezing immediately becomes louder and better marked in every way. On causing the animal to run, he goes a few steps, stops, and begins coughing. An examination should now be made of the interior of the throat. Use the mouth speculum to keep the mouth open, and make a thorough examination, when fluctuation may be found in some part of the throat.

Treatment.—Having found the abscess, it should be opened by means of a guarded lancet or knife. As soon as it is opened, the hand should be quickly withdrawn, and the pus allowed to escape. If possible, the animal should be allowed to retain the standing posture, as in this way all danger of the pus escaping down the trachea and causing death of the animal will be obviated. Swab the mouth out afterwards with some antiseptic, such as solution of boric acid or chinosol, etc.

CHOKING

Choking, whilst occurring in all animals, is of most frequent occurrence among cattle. It is caused by the arrest of the substance swallowed while on its way to the stomach, giving rise to a clogging up of the œsophageal passage, and preventing the passage of food and liquids into the stomach.

Causes.—A very greedy animal in an endeavour to get more than his share of food neglects to properly masticate it, and makes an endeavour to swallow large quantities at a time, as a result of which the œsophagus becomes crammed with the food, the peristaltic motion is not sufficient to force it down into the stomach, and, after awhile, ceases. Choking caused by improperly masticated food is very troublesome. Potatoes, apples, turnips, carrots, eggs, bones, are also common causes. Choking can be prevented to a very great extent by causing the animal to take his food from the ground, so that the head will be kept down while he is eating, in which case he will not be so likely to choke. No explanation is offered for this fact; still, it is well known to be the case. A fit of choking may also be caused by the administration of a very large bolus, and more particularly if it be hard, hence a bolus should always be of medium size, and moderately soft. Eggs given with the shells unbroken, as a remedy for colic, have been known to produce very severe fits of choking. But dry food becoming impacted, especially if the whole course of the œsophagus be involved, is the worst of all forms of choking. This kind is likelier to occur in very greedy animals, especially if such are old, the teeth worn, in bad order, and the salivary glands not actively secreting.

Symptoms.—About the first symptom is slight uneasiness on the part of the animal. Coughing, violent attempts at swallowing, succeeded by equally as earnest efforts to regurgitate, retching, spasmodic, movements of the neck, etc., are prominent symptoms. If the animal attempts to drink, or is given a draught, most of the liquid returns through the nostrils. A free discharge of saliva is usually observable; the abdominal muscles contract and draw up the belly; the animal curves his neck and retches violently. This symptom is more particularly noticeable when the choking is in connection with that part of the œsophagus which is situated within the thorax. Sometimes the obstruction can be detected when situated within the cervical portion of the œsophagus. A well-marked symptom in cattle is a tympanitic condition of the rumen. Tympanitis very rarely occurs as a symptom or result of choking in the horse. When the obstruction is situated high up in the cervical portion of the œsophagus, symptoms of suffocation are frequently presented; but such may last for a considerable length of time without the case terminating fatally.

Treatment.—The practitioner should endeavour to find out the probable cause of choking—whether a piece of leather, an apple, dry food, etc.—as the course of treatment depends to a considerable extent upon the nature of the obstruction. Unless the symptoms are very urgent, an effort should be made to dislodge the obstruction by manipulation. The head of the animal should be held firmly extended by an assistant, while the practitioner gently manipulates and endeavours to break up the mass, or, if it be an apple, endeavours to force or favour its passage onward. If the obstructing body is lodged in the pharynx, the hand may be passed back into the mouth through a balling iron, and the cause of the trouble grasped with the hand and removed. In other cases, oil and water may be given the animal in a draught, in order to lubricate the passage. The mixture, while causing an effort on the part of the animal to swallow, also has a tendency to soften and break up the obstructing mass if composed of dry food, and its removal frequently is effected in this way. If the above measures are not successful the probang must be employed. For cattle a strong leather probang with a good knob on it should be used. One of smaller size should be used for the horse—whalebone probangs—on account of their liability to break, should never be used. The probang should be well lubricated and passed gently back into the œsophagus until the obstruction is reached, when gentle force should be brought to bear to cause its passage downward into the stomach. It is always wise to use the gag or balling iron to prevent injury to the probang. If the obstructing mass be composed of dry oats or bran, the practitioner should be very cautious with the probang, as the mass may be made harder. Inject some oil directly into it in several places with a hypodermic syringe, then manipulate the mass between the fingers and endeavour to cause it to become disintegrated. This is often successful. If the mass becomes partially dislodged the administration of some oil and water again will, as a rule, cause the food to pass on to the stomach without anything further being done. In the case of an apple becoming lodged, a probang with a screw and a stiletto should be used. The apple should be pierced in several places with the screw until it becomes broken down, when the probang may be withdrawn, and a small quantity of oil and water administered. As a rule, nothing more will be required. In cases where the probang is proved to be of no avail, recourse must be had to the operation of œsophagotomy. It is a very successful operation, as a rule, and in cases where every other means have been tried and failed to give relief, this procedure becomes justifiable, and must be performed as the only means of saving the life of the animal. It is essential that the operation be performed before the animal becomes too much weakened and exhausted. The operation is one very easily performed by anyone having a knowledge of anatomy, the chief objection to its performance being the difficulty sometimes experienced in getting the wound to heal. If possible, the œsophagus should be laid open by a clear incision of the scalpel, as, in such a case, the wound will be likelier to heal properly. The animal also, while standing quietly under one stroke of the knife, is certain to become restless if the operation be slowly performed and with many cuts of the knife. The incision should be made right over the region of the offending body which, when reached, should be gently removed, and the parts nicely cleansed with tepid water and antiseptics. The divided edges of the œsophagus are then brought together and firmly secured in place by means of sutures of carbolized catgut. The external opening may be secured in a similar manner. The after-treatment consists of keeping the animal quiet for a few days, and feeding on liquid food, gruels, etc., allowing no solid food until the wound has entirely closed. Some of the results of choking are dilatation, or the formation of a pouch in the œsophagus, rupture of the œsophagus, asphyxia, and septicæmia.

DILATATION OF THE ŒSOPHAGUS

As a result of choking, the œsophagus may become abnormally dilated, or a pouch may be formed, in which food accumulates to a greater or less extent, the pouch gradually growing larger until it attains an enormous size and gives rise to considerable trouble.

Symptoms.—If in the thoracic region the animal will be a slow feeder, and subject to repeated attacks of choking, which may be mistaken for spasm of the œsophagus; a change of food will generally bring on one of these attacks. If the pouch is situated in the cervical portion of the œsophagus a bulging can be seen and felt. Passage of the probang may assist in forming a correct diagnosis.

Treatment.—Very little can be done. Sloppy food only should be allowed the animal, and when a fit of choking comes on, oil, etc., should be given. If the pouch is situated in the cervical portion of the œsophagus, considerable advantage results from the use of a pad placed over the part if it can be kept in place.

STRICTURE OF THE ŒSOPHAGUS

Stricture of the œsophagus also occurs as a result of choking. The walls of the œsophagus become thickened to a certain extent, or a contraction of the muscular fibres of the coats of the œsophagus takes place. It may coexist with dilatation, etc., of the œsophagus.

Symptoms.—The animal is subject to frequent fits of choking, etc. On attempting to pass the probang, it proceeds along the passage very well until it reaches the seat of stricture, when its further passage is resisted; but by using gentle force, and taking plenty of time, the stricture gives way, and the probang passes on.

Treatment.—As a rule, treatment is useless, but occasionally the condition may be overcome by passing a probang every day, beginning with one of small size, and each succeeding day using one slightly larger.

RUPTURE OF THE ŒSOPHAGUS

Rupture of the œsophagus may be caused by using too great force when passing a probang. The use of a whip-stock, stick, or other improper substitute in place of a probang is also a very prolific cause.

Symptoms.—The symptoms of rupture of the œsophagus are, as a rule, pretty well defined. The animal becomes dull and listless, respiration is more or less affected, and a swelling can be detected over the course of the œsophagus. On passing the hand down over the swelling the animal evinces a considerable amount of pain. After a short time the whole neck becomes swollen and the breath fetid. The history of the case will materially assist in forming a correct diagnosis. If told that the animal was choking, and that a stick, etc., was passed to relieve him, the practitioner may feel certain that the case is one of rupture of the œsophagus.

Treatment.—As a rule, treatment is of no avail. In the case of a small rupture the practitioner may cut down upon it and see what can be done with sutures, etc.; but in most instances the patient should be put out of his misery as quickly as possible.

CHAPTER XVII

Diseases of the Stomach and Intestines

SIMPLE INDIGESTION

DISEASES of an organic nature in these parts are not common, but functional derangement of the digestive system is very common. When a horse is constantly fed on bulky, coarse food the stomach becomes distended. The distension taking place at the expense of the walls of the stomach, the walls become attenuated, and when any acute form of disease attacks the stomach, rupture of the viscus is likelier to occur than if the horse had been properly fed, and consequently the stomach in a normal condition. When the food does not digest properly a condition known as indigestion becomes established. In a large majority of cases the intestines are involved. Indigestion occurs in the chronic, acute, and simple forms. In the human being it is known as dyspepsia. In the horse digestion goes on very quickly, the stomach of the animal being very small in proportion to the size of the body. This is one of the wise provisions of nature, and allows the horse to undergo more or less severe exertion after a full meal without any great amount of inconvenience.

Simple indigestion is by no means uncommon in the horse, and may be indirectly caused by sharp and projecting teeth, poor quality of food, etc.

Symptoms.—The animal suddenly falls off in condition, and may become considerably emaciated; the condition known as hide-bound makes its appearance as a symptom; the coat is staring and dead-looking, and there is a general appearance of unthriftiness. Slight but frequent attacks of colic occur; the bowels are irregular, sometimes constipation and sometimes diarrhœa, being present; the animal shows a most depraved appetite, and often eats with an apparent relish the most filthy substances. They are particularly fond of lime and salt, and will lick a wall for hours to get the lime contained in the mortar. The pulse is weak, and the liver may be more or less involved, in which case there is well-marked yellowness of all the visible mucous membranes.

Treatment.—In many cases there exists over-acidity of the stomach, and the practitioner may be certain that such is the case when the animal is observed to show a craving for alkaline substances, such as lime, salt, etc. Give a liberal supply of salt, and administer a mild aloetic laxative, especially in cases where the liver is involved. A drachm of calomel may be added to the aloes. Sodium or magnesium sulphate may also be given with benefit. When signs of improvement become manifest, tonics are to be administered, as quinine, gentian, the various preparations of iron, etc. If the animal appears to be very weak or debilitated, stimulants, as ale, beer, wine, whisky, etc., should be given. Rasp the teeth if necessary, change the food, groom the horse well, and give regular exercise, etc.

ACUTE INDIGESTION

Acute indigestion, or, as some call it, 'gorged stomach,' is a very common as well as a very fatal disease. It is probable that two-thirds of the heavy horses, more particularly the stallions, dying in the United States and Canada, die of acute indigestion. The light breeds of horses do not suffer so frequently as the heavy horses. Often considerable distension is observed, which may be due to the presence of large quantities of food, or may be caused by gas in the stomach or intestines, the gases formed being sulphuretted hydrogen, carburetted hydrogen, and carbonic acid gas. Rupture of the stomach occasionally occurs. In other cases the stomach and bowels become so distended that the movements of the diaphragm are interfered with, and the animal dies of asphyxia.

Causes.—A common cause of acute indigestion is the custom of giving the animal a large feed, and then subjecting him to severe exertion. Perhaps the owner, when about to drive fifteen or twenty miles, through a mistaken idea of kindness, allows his horse to have a large quantity of food just before starting on the journey, in addition to which the animal may be a greedy feeder, and does not fail to consume all the food set before him. He starts off at a pretty rapid gait, with the stomach and bowels full. The exertion of travelling causes the blood to be drawn away from the stomach, where it is needed in the process of digestion. In consequence of this, digestion becomes seriously interfered with, and in some cases the process may be completely checked. All the symptoms of acute indigestion are presented. Feeding largely when the stomach is weakened is another cause of this disease. When an animal has been driven or worked hard for six or eight hours, and is tired and hungry, the stomach at such a time is not fitted for the reception of more than a very small quantity of food. Certain descriptions of food, as wheat, barley, Indian corn, also tend to produce the disease. Oats are the best description of food for horses. Green food, when eaten of very heartily, will also cause an attack; and it often follows the feeding of bran in immoderate quantities, especially when of an inferior quality. Sometimes a very slight change of food will cause an attack of acute indigestion. It also occasionally follows the use of chop feed. Another cause, and one that gives rise to the disease in its worst form, is the practice of feeding horses on mouldy or decomposing bread; this is done to a great extent in cities, and may result in gastroenteritis.

Symptoms.—The animal, having had a large quantity of food, is started on a journey. After going a few miles he becomes somewhat dull and sluggish in his movements. Soon he shows a slight uneasiness—cringes and turns his head to one side, and seems to be in slight pain, but he is whipped up, and the symptoms disappear for awhile. However, they soon return, swelling of the abdomen becomes apparent, the animal's pain increases, and perhaps the journey's end is reached with great difficulty. On being set at liberty he begins to toss about, rolls from side to side, and endeavours to balance on his back. When lying down he occasionally raises his head, and looks wistfully towards his flank. As a rule, the abdomen is greatly distended, and there are eructations of gas, and often an escape of gas per anus. The eructations of gas show that the stomach is distended, and may be regarded as a good sign, inasmuch as the escape of gas by any outlet gives great relief. Regurgitation of food may also be noticed as another symptom, but one which is not always present. In some cases sweats bedew the body; there may be slight diarrhœa, the rectum protrudes and is irritable, he rolls and tumbles about in a violent manner. When the anus is reddened and protruding, it should be regarded as a very bad symptom. The pulse at first is full, but gradually becomes weak and quick. In the early stages the mouth is hot, then becomes cold and clammy, the limbs lose their natural heat and become cold, the eyes take on an amaurotic stare, cold sweats break out, the animal walks about in a semi-unconscious condition, occasionally staggering or reeling slightly, may fall back upon his haunches, and finally fall to the ground, gives a few convulsive struggles and dies.

Treatment.—The treatment of acute indigestion, to be successful, should be prompt and energetic. Stimulants and purgatives are the remedies to give in a majority of cases, and if pain be excessive, it should be relieved by the judicious administration of opiates. Sulphuric or nitrous ether, carbonate or aromatic spirits of ammonia may be given in the full doses, and are valuable as stimulants. A good draught in most cases is as follows: Æth. Sulph. ʒi.—ʒii., Tr. Opii ʒi., Ol. Lini., Oi.; Ol. Terebinth may sometimes with advantage be substituted for ether in the above draught, and followed by a full dose of cathartic medicine. A ball composed of Aloes and Sodæ Bicarb. should be given. If much pain is present, it may be allayed by the subcutaneous injection of morphia. Enemas cannot be overdone in a case of acute indigestion; they should consist of tepid water, with a sufficient quantity of soap in it to make it slippery to the touch, and Ol. Terebinth ʒi.—ʒii. Judicious counter-irritation, as mustard to the belly, hand-rubbing the abdomen, etc., is often of great benefit. If relief is not afforded by the first draught, another should be administered in the course of twenty minutes or half an hour. Where there is any tendency to inflammatory action, Ol. Terebinth should be withheld; but where there is no such tendency, it is far preferable to ether. Calcium Chloride, Sodium Carb., Ammon. Carb., etc., are often given to dissipate the gases generated within the stomach; they prevent further formation, and counteract the acidity of the stomach. In certain cases belladonna may, as an anodyne, be given with more satisfactory results than any of the preparations of opium. It is as necessary to know when to stop the administration of medicine as it is to know when to begin; hence, when relief is obtained, and improvement in the condition of the animal is manifest, medicinal agents should not be pushed too far. In cases where there is a tendency to enteritis, and injections are being freely used, soap should be omitted after the first one or two injections. The animal should be comfortably clothed so as to preserve the surface temperature and prevent cold sweats. If sweats break out, the patient should be carefully guarded from draughts of cold air. The legs may be well hand-rubbed and bandaged with flannel. In cases of great distension, the animal must be kept from throwing himself violently about, as rupture of the stomach or bowels might occur in consequence of a very violent movement on the part of the animal. When tympanites cannot be relieved in any other other way, recourse must be had to the operation of puncturing the colon—using the trocar and cannula for the purpose. It may safely be said that hypodermic injections and the trocar and cannula rob this disease of half its terrors. Opii Tr. is very good to allay pain, given by the mouth if the stomach is empty; but when the stomach and bowels are full of gas, medicines given by the mouth are not absorbed very readily or very certainly. Chloral hydrate is recommended, and is undoubtedly of great benefit in many cases. A purgative should never be omitted, as it is probable that purgatives relieve spasm and pain before developing any of their physiological actions. Nux vomica may, in some cases, be combined with the purgative, accelerating as well as rendering its action more certain. Animals, when suffering from acute indigestion, are frequently supposed, by certain people, to be poisoned. In cases where it becomes necessary to pass the trocar and cannula, the operation should not be too long deferred, but should be performed while the animal has plenty of strength and vitality left. The operation is usually done on the right side of the animal, but may be made on either side. The trocar should not be used until the distension becomes well marked. The skin may be first divided by the lancet for the purpose of facilitating the entrance of the trocar and cannula. In case the colon is not punctured at the first attempt, the operator should not be discouraged, but should try again. After the gas has escaped, the cannula may be withdrawn, and the opening usually heals by the first intention. In some cases an abscess results from puncturing; when it does, it should be opened and treated as an abscess in any other part of the body. If pure gas and nothing else escapes through the cannula, it is to be regarded as a favourable symptom; but if a dark-coloured fluid passes out also, it should be regarded as a bad sign, and one indicating that more or less inflammation has taken place. However, it is not by any means to be regarded as an infallible sign of death. It is said that an ounce of prevention is worth a pound of cure, and the saying will apply to acute indigestion; it is a disease easily prevented—nothing more being necessary than a little attention on the part of the attendant, who should see that the food is of good quality, and is given to the animal in proper quantities and at regular intervals. An animal should never be put to severe exertion immediately after a full meal, neither should he be allowed to drink large quantities of cold water immediately after having partaken heartily of food. Good grooming once or twice daily exerts a much greater influence over the health of the animal than is generally supposed. It is also essential that he should have sufficient exercise, and at proper intervals. Atmospheric draughts should be avoided, but a bountiful supply of fresh air is indispensable.

RUPTURE OF THE STOMACH

Rupture of the stomach occasionally occurs as a result of acute indigestion, and may occur without the bowels being much affected.

Symptoms.—The symptoms of rupture of the stomach are never very positive, and in no case is the practitioner able to state positively that rupture has taken place; still, he may be able to form a very good idea. A prominent symptom is vomition. It may be said to be a premonitory symptom, as it occurs before rupture takes place, or, in some cases, it may possibly occur after a very small rupture has occurred; the pulse becomes very quick and weak, and the ears cold, as are the extremities and body; the animal turns around or walks in a circle, moving about in a semi-unconscious state, lies down, and sits up on his haunches after the manner of a dog; the eyes take on an amaurotic stare, cold sweats bedew the body, and death soon occurs. There is every reason to believe that animals have lived for eight or ten hours after rupture has taken place, but death usually occurs sooner. Rupture of the stomach is always fatal.

IMPACTION OF THE STOMACH

Impaction of the stomach is most likely to occur in old horses that have been fed on coarse and inferior food. A sudden change is made to good food, which does not undergo the process of digestion, but remains in the stomach and becomes impacted. It may also occur in consequence of feeding an animal largely on coarse food when very much fatigued. A well-marked case of impaction of the stomach may occur without the generation of gas.

Symptoms.—There may occasionally be a slightly tympanitic condition after a time, which is to be regarded as a very unfavourable symptom. There is usually a tucked-up appearance of the abdomen, the animal paws and rolls, turns his head to his side, the pulse becomes quicker and fuller, and, unless relieved, death soon occurs. Impaction of the stomach usually gives rise to well-marked symptoms of nervous derangement, producing delirium, and sometimes coma, and paralysis. Over-ripe grasses and buckwheat are the descriptions of food most likely to cause these symptoms. Decomposing and frozen roots also have a similar effect. The animal is dull, drowsy, and has no appetite.

Treatment.—A powerful diffusible stimulant should be given first, and followed by a full dose of cathartic medicine in combination with nux vomica, the latter being especially beneficial in cases where symptoms of nervous depression are manifested. Carminatives may be freely used. If griping pains are present, clysters should be freely given. A decoction made by boiling tobacco ℥i. in a gallon of water, and added to sufficient water for an enema, is of great service. Any good stimulant, as ammonia, ether, etc., may be used; but a good alcoholic stimulant is the best. Soap should not be used too freely in the clysters, as it has a tendency to cause irritation of the mucous membrane of the bowels. Venesection and the subsequent abstraction of a fair quantity of blood often gives speedy relief when the animal is delirious.

CHRONIC INDIGESTION

Chronic indigestion may be produced in various ways, as by feeding an animal for a long time on large quantities of oats, etc., the stomach being overtaxed and finally failing. Chronic indigestion is also occasionally associated with functional derangement of the liver.

Symptoms.—There is apparently nothing the matter in many cases, except that the patient appears very dull and languid, sweats easily, and the coat has a dry and dusty appearance, instead of the sleek glossy coat of health. In many cases the pulse is found to be slower and weaker than natural, and the animal may be subject to slight attacks of colic. There may be a slight attack of diarrhœa, followed by constipation, the fæces being either of a very dark or a very light colour, the latter being a symptom of hepatic derangement, in which case there may also be observed a more or less well-marked yellowish tinge of all the visible mucous membranes. The appetite is usually very capricious, and often depraved; one day the animal may feed ravenously and on the following day refuse to touch any description of food. Various substances, as dirt, lime, etc., when accessible, are often eaten, apparently with great relish. This form of indigestion is in all probability due, in many cases, to an insufficient supply of salt.

Treatment.—The animal should be dieted for a dose of cathartic medicine, as a dose of aloes always acts better when the patient is previously prepared. The preparation consists of allowing nothing but bran mashes to eat for at least twenty-four hours previous to the administration of the medicine. If the liver is involved, an ordinary dose of calomel may be given with the purgative, carminatives should be given afterwards—soda, ginger, etc., being serviceable. At the proper time tonics may be administered with great benefit, but if given too soon will only be productive of harm. Coriander seed and common salt are other remedies recommended by some excellent practitioners. Rock salt is very useful, both as a prophylactic and as a useful adjunct to other remedial agents, when the disease is present—a lump of rock salt should always be kept in the manger. If gastritis be present, drastic purgatives are inadmissible, but oil in the ordinary quantities may be administered. Mild alkaline drugs, such as sodium carbonate, aid digestion. Ether and other diffusible stimulants are also useful. The body should be clothed and the extremities well hand-rubbed and bandaged with flannel, the general hygiene being attended to as well as is possible under the circumstances in which it is placed. Grooming must not be neglected, and the food should be of an easily digestible character.

GASTRITIS

Gastritis, or inflammation of the stomach, is usually caused by the presence of irritants or poisons in the stomach. An overdose of arsenic causes gastritis, as does drinking brine, eating of the yew-tree, etc.

Symptoms.—The animal manifests great pain, and sometimes sweats freely; the pulse runs down, etc. It is sometimes fatal, although not so invariably fatal as enteritis. The disease is not common in the horse, but is of frequent occurrence amongst dogs, and is also met with amongst cattle. In cattle the chief symptoms are loss of appetite and general dulness, with refusal to feed. In the dog vomition is constant, the vomit being often tinged with blood. There is great prostration, especially in the later stages. In this animal there is a form of the disease which is epizoötic in character (epizoötic gastritis) and very fatal in a large proportion of cases.

Treatment.—If possible, the cause of the gastric inflammation should be ascertained, and if it is found to be due to the presence of arsenic in the stomach, the various preparations of iron will be found useful, the best preparation being the freshly prepared hydrated sesquioxide of iron. If the nervous system be much depressed, nothing can be done except to give small and repeated doses of stimulants and mucilaginous draughts. If great pain be manifested, give opiates. If mercury is found to be the cause of the trouble, albumen, as the white of eggs, wheat-flour, etc., should be given in large quantities. Judicious counter-irritation over the region of the stomach and bowels is also of considerable service, and in those cases where the case is got before the poison has entered the circulation the stomach may be emptied as quickly as possible by an emetic. For the dog and cat the most convenient drug for this purpose is apomorphine used in solution, as the hypochlorate, and injected hypodermically. It acts within a very few minutes and does not leave the after nauseating effects behind such as follow the use of some emetics. Other agents used are soap and water, mustard or salt and water, a solution of zinc or copper sulphate (the latter is antidotal to phosphorus), tartrate of antimony, and ipecacuanha.

SPASMODIC COLIC

Spasmodic colic is one of the most common of all bowel diseases of the horse, and is known also as gripes, belly-ache, etc. It consists of spasmodic contraction of the muscular fibres, usually of the small intestines, but occasionally of the large intestines.

Causes.—Spasmodic colic may be caused in many ways, the most common cause of the disease, in all probability, being a sudden change of food, and more especially when the change is from good food to food of an inferior quality. It may also be caused by allowing the animal to drink large quantities of cold water when overheated and in an exhausted condition, colic being more likely to occur when the animal is exhausted than when he is not. Feeding roots tends to produce colic, carrots being particularly liable to induce an attack, a couple of carrots being quite sufficient to produce a very severe attack of colic in some horses. Sudden alternations of temperature, particularly from heat to cold, tend to produce the disease. The action of cathartic medicines, or any irritant, in connection with the abdominal cavity, may, and frequently does, give rise to severe attacks of colic; hence a purgative of a drastic nature should never be given unless combined with a carminative, as ginger, gentian, etc. It is a disease seldom fatal, and never of very long duration, but is of exceptional severity during the short period it lasts. In fatal cases the patient dies of exhaustion, and a post-mortem examination reveals more or less extensive adhesions of the muscular and mucous coats of the intestines. As a rule, there is no tendency to any inflammatory action. Pea-straw and raw potatoes have a strong tendency to cause colic.

Symptoms.—Colic is characterized by the suddenness of the attack. The animal is seen apparently in good health, standing quietly eating his hay, when he is suddenly seized, turns his head around to his side, whisks his tail, stamps and paws, and in some cases kicks as though he were trying to strike his abdomen with his hoof; he cringes, then suddenly casts himself violently upon the ground, and rolls violently from side to side, while apparently he is suffering pain of a most agonizing character. After rolling awhile he gets up; and after standing quietly for a few minutes, and evidently free from pain, he is suddenly seized again, and goes through the same performance as before. During the attack the pulse runs up rapidly, and usually attains a speed of about sixty beats per minute. Still, it occasionally runs up to seventy or eighty in a pure case of colic. During the interval when the animal is standing quietly, and suffering no pain, the pulse-beats rapidly decrease in number, until the rate becomes normal. During the attack the patient generally makes frequent but ineffectual attempts to urinate. The neck of the bladder, being spasmodically contracted, prevents the proper performance of the act; but when the attack is relieved he generally urinates freely: hence a copious flow of urine is usually regarded as a sign of improvement. The ears and extremities, in some cases of colic, become deathly cold. Whilst rolling he sometimes makes an effort to balance himself upon his back. He generally paws and turns around a few times before lying down. The belly has a tucked-up appearance. The animal usually begins to eat freely during the intervals between the paroxysms, and passes fæces, sometimes of a hard character, in other cases more or less diarrhœa is present; and when diarrhœa is observed in connection with an aggravated case of colic it is to be regarded as a bad sign, inasmuch as it indicates that the case has a strong tendency to terminate in enteritis. As a rule, the ears and legs remain warm, but may be cold in some cases, particularly when the animal has been sweating freely. An attack of colic may last from fifteen minutes to twelve or fifteen hours. However, in the latter case it must be a very mild attack, or the animal would not be able to survive for that length of time. Sometimes a case of enteritis may be mistaken for an attack of colic, the symptoms being very much alike. It is a matter of great importance that no such mistake be made; hence the practitioner should be thoroughly acquainted with the symptoms of each disease, in which case there will be no trouble in discriminating between the two. In colic the eye is usually bright and clear, and the limbs and ears of a normal temperature; while in enteritis the eye is dull, and usually bloodshot, the ears and extremities being deathly cold. In colic the paroxysms of pain alternate with intervals of rest and absolute freedom from pain; while in a case of enteritis the pain is continuous, there being no intervals of ease, although the pain may be greater at one time than at another. In colic the pulse is normal, or nearly so, except when the animal is seized with a paroxysm. In enteritis the pulse runs up higher than in a case of colic, is hard and wiry, and steadily maintains that character, and pressure upon the abdomen calls forth an expression of pain ; while in colic the relief afforded by similar pressure is evident to almost anyone. He also lies down and gets up more carefully when suffering from enteritis than he does when he is suffering from colic. In cases of colic that recover, the paroxysms become shorter and less frequent, as well as less violent. In fatal cases the paroxysms become longer and more violent in character, the intervals of ease shorter and shorter, until finally the case terminates in volvulus, or enteritis and death, or the case may terminate in death from sheer exhaustion.

Treatment.—The disease is one that is usually very satisfactory to treat. However, the treatment should always be prompt and energetic. Phlebotomy undoubtedly antagonizes spasm, but its practice is one not to be recommended, as far better means by which spasm can be controlled are known to the profession. As soon as possible a draught should be administered, a very good one being as follows : Eth. Sulph., Tr. Opii āā ℥i.—℥ii. ; Aquæ, Oi. Belladonna in the ordinary-sized dose may, in many cases, be substituted for Tr. Opii. A laxative should always be given to clear out the intestinal track, because colic is always due to the presence of something which acts as the exciting cause of the disease, and unless that something be removed, it may remain and cause another attack of colic in a day or two afterwards. However, a powerful purgative should never be given, an oleaginous one being preferable, on account of the danger of superpurgation. Subcutaneous injections of morphia may be given to allay pain, and are especially serviceable if the stomach is distended with food. Clysters of tepid water cannot be overdone. A little soap and Ol. Terebinth may be added to the first and second injections, but to none of the others.

Some practitioners advocate the administration of Ol. Terebinth in a draught. It will do very well in a case of pure colic, with no tendency to inflammation; but if there is any tendency to inflammation it is inadmissible, its administration meaning almost certain death. Ammonium carbonate is another very useful drug. Tr. of Aconite is often used with good effect. In a severe case a judicious amount of counter-irritation to the abdomen is beneficial. Mustard and ammonia may be applied with friction, using the hand for the purpose. The body should also be warmly clothed, and the patient protected from cold draughts of air. Any good diffusible stimulant will usually be sufficient to cure an ordinary case of colic, beer, whisky, etc., mixed with warm water, being good. If it is seen that the first dose does not have the desired effect, it may be repeated in twenty minutes or half an hour. Care should be exercised in the administration of hypodermic injections of morphia, as they may very easily be overdone. The animal should be put in a place where he cannot injure himself, and allowed to roll as much as he wishes, this being his method of obtaining relief in all abdominal disorders, and he undoubtedly suffers less when allowed to roll than when compelled, by whipping, etc., to remain upon his feet, and forced to gallop about with some one upon his back. Some of the measures adopted by ignorant men and quacks are absurd in the extreme, as, for instance, putting salt in the ear, forcing the animal to swallow the intestines, reeking hot, just torn from a fowl, buttermilk and soda, sweet milk and molasses, the employment of charms, and such-like nonsense.

FLATULENT COLIC

Flatulent colic is caused by the generation of gases within the large intestines. The same gases are generated in flatulent colic as are evolved in acute indigestion. The symptoms of flatulent colic are also very similar to those of acute indigestion, so much so that one conditon may very easily be mistaken for the other; indeed, some practitioners claim that the diseases are identical, and that acute indigestion is merely another name for flatulent colic; but such is not the case, the two diseases being widely different in character, acute indigestion being a much more serious condition than flatulent colic.

Causes.—The causes which operate in producing flatulent colic are many, the most common cause being coarse, inferior food, especially hay or corn that is sour and mouldy, or otherwise damaged. A sudden change of food is also frequently followed by an attack of flatulent colic. Imperfect mastication, owing to defective teeth, etc., in consequence of which the food is swallowed unmasticated, may also be mentioned as a cause of this disorder, and especially in the case of very old animals, whose digestive powers are impaired.

Symptoms.—The animal ev[illegible] slight uneasiness, and paws, turns his head to one si[illegible]ows himself upon the ground, and rolls; the pulse runs up, and soon the abdomen is observed to be gradually increasing in volume—becoming distended with gas. In a well-marked case the distension increases until the abdomen attains an enormous size. The ribs of the leanest horse now can no longer be located, the swelling in some cases being so great that even the antero-external spine of the ilium can scarcely be located with the eye alone. The suffering of the animal becomes very great. He is stilty and sluggish in his movements; a cold sweat may break out; the countenance betokens great anguish; the ears and extremities of the patient become cold, and if relief be not afforded very quickly death will soon result. When the abdomen is so enormously distended with gas the animal should, if possible, be prevented from throwing himself violently upon the ground, as such an act would be very likely to cause rupture of a bowel, and, of course, certain death would be the result. In a pure case of flatulent colic there are never any eructations of gas, though there may be frequent escapes of flatus through the anus. The animal lies down and gets up more carefully than when suffering from spasmodic colic, and the pain is also more constant than in the latter disease. The abdomen, on being struck with the fingers, gives out a resonant drum-like sound, and is tense and elastic to the touch. This form of colic is far more serious and dangerous to life than spasmodic colic.

Treatment.—The treatment must be prompt and energetic. The administration of diffusible stimulants is indicated, hence give ether, ammonia, or turpentine in full doses, the latter remedy being preferable. Frequent enemas may be employed with great benefit, and should consist of tepid water with a small quantity of sodium chloride in solution. An escape of gas *per anum* affords relief, and is to be regarded as a favourable sign; and at this time remedies must not be pushed too far, or harm may result. Tobacco enemas are highly useful in this as well as the other forms of colic. Agents which combine chemically with or otherwise combat the formation of gas should be given; hence asafœtida, lime, soda, turpentine, etc., may be given, and in many cases it is good practice to follow with a purgative; but the practitioner must be discreet in the administration of purgatives, as they occasionally set up a considerable amount of irritation. In cases where the treatment described above has been tried and failed to give relief, recourse must be had to the operation of puncturing the colon to allow the escape of the gas contained therein. This operation, if properly performed, and before the vital energies have become weakened to any great extent, in a pure case of flatulent colic, is almost uniformly successful, being rarely, if ever, followed by any very serious results. The animal begins to experience relief the instant the trocar is withdrawn, and by the time the gas has all escaped the animal ceases to suffer. A purgative should never be given after this operation. The animal should be placed in a loose box and kept quiet for forty-eight hours or so, fed very sparingly and cautiously for some days, to prevent a return of the disorder.

ENTERITIS

Enteritis is, in the lower animals as well as in man, one of the most serious and fatal of all diseases, and a well-marked case of enteritis in the horse is almost invariably fatal. By enteritis is meant an inflammation of the bowels. Any one or more of the intestinal coats may be involved, but, as a rule, the inflammation is confined to the inner coat, or, at least, begins in the mucous coat, and extends to and involves the other coats of the bowel. The large intestines are most frequently involved, although inflammation in connection with the small intestines is by no means uncommon. In some cases only six inches, in other cases eight or ten feet, or a still greater length, of bowel may be involved in the inflammatory process. In many cases where death occurs very quickly after the appearance of the attack, great doubt may justly be felt as to whether a true inflammation existed, the inference being that in such cases death resulted from intestinal congestion, for the reason that an animal may pass from perfect health to death in a few hours. Hence it is claimed that a true inflammation could not be set up in the healthy parts in such a limited length of time. It is one of the most surely and rapidly fatal diseases to which horseflesh is heir, and, although very common, is by no means as common a disease as it is generally supposed to be.

Causes.—A great variety of causes operate in the production of enteritis, and some animals—as, for instance, weak and washy animals—are more subject to diseases of the digestive organs than more robust animals, and such may be considered as predisposed to enteritis. The disease may be caused by superpurgation, and also may occur as a result of either spasmodic or flatulent colic, although it is claimed by some writers that enteritis never follows those diseases. Croton oil was at one time a prolific cause of the disease. An over-accumulation of fæces in the intestinal canal frequently sets up irritation, which gradually increases and terminates in enteritis. Foreign substances, as sticks, sand, calculi, etc., passing through or becoming lodged in the intestinal canal, are very likely to cause an attack. Irritant poisons, drastic purgatives, the presence of any irritant in the intestinal canal, drinking stagnant or putrid water, diarrhœa, especially when of the inflammatory type, exposure to cold, or being allowed to stand in draughts of cold air after sweating freely, or when considerably weakened or fatigued by exercise, a drink of cold water when the animal is in a heated condition, all operate in the production of enteritis. A mixture of bran with cold water sometimes causes the disease. Intussusception, volvulus, etc., also gives rise to enteritis. It is rarely, indeed, that a horse lasts longer than twenty-four hours from the appearance of the first symptom until death takes place, and often a case will terminate in gangrene of the bowels and death in four or five hours. Occasionally the patient may live for four or five days; such a case is always mild, and may in the end be cured.

Symptoms.—In the early stages of enteritis the symptoms are very similar to those of colic and other painful bowel affections. In such cases as are not suddenly developed, slight but increasing dulness may be observed for a day or two preceding the attack. The animal then begins to show more or less uneasiness, and generally the first symptom, sufficiently marked to attract attention, is pawing, which may be kept up for hours, the animal pawing with first one foot and then the other. Soon he may be observed to cringe and look at his side. Usually, at this time the pulse may, on a close examination, be found to be slightly accelerated, beating perhaps at the rate of forty-five per minute, and being full and bounding. The mouth is warmer than natural, and the eye presents a more or less injected appearance. The animal now becomes more restless than ever, lying down and rolling, performing both acts in as violent a manner as though suffering from an attack of colic. As the disease progresses he becomes more careful in his movements, lying down and rising very carefully, and usually turns around two or three times before lying down. As the disease advances, the pain, which is evidently of the most agonizing character, increases, and when down he tries to roll upon his back and balance himself in that position. It may also be observed that the animal uses every endeavour to prevent the abdomen from coming into contact with, or resting upon, the ground. He will occasionally turn on his side, but will not remain in that position for more than a few seconds, rising and looking at his side, turning around again and quickly lying down. The abdomen is tense and hard to the touch, and pressure upon it calls forth an expression of pain; cold sweats break out, the animal will not notice food or drink, and after awhile there may be noticed a peculiar sighing breathing, and perhaps a short period of quietude. The pulse becomes quieter, but still retains its full and bounding character. At a later stage of the disease it becomes small and wiry, and this is a symptom of very serious import. The eye now may very properly be described as bloodshot, the cornea becomes glassy and amaurotic in appearance, and the patient seems to be in a semi-unconscious condition, wandering about his box and taking no notice whatever of his surroundings. Soon there comes a period of quietude, which may be called the critical period of the disease. If the pulse at this time begins to recover its tone, it may be regarded as a sign of recovery; but if the pulse is weak and running down, the body and extremities cold, the mucous membranes blanched, the mouth cold and clammy, the case may be regarded as hopeless, the symptoms enumerated indicating that gangrene has attacked the bowels, which, in consequence, have become insensible to pain, hence it is that the patient stands quietly. At this time the attendants should be very careful as to how they approach the animal, as he may at any moment, without the slightest warning, fall as though struck by lightning, and, unless care is exercised, may fall upon and severely injure someone. The bowels are usually constipated throughout the attack, a few hard pellets of fæcal matter covered with mucus, and sometimes blood in addition to the mucus, may be passed in the early stages of the disease. Frequent attempts to urinate should not mislead the practitioner as to the true character of the malady. The urine when passed is scant in quantity and of a heightened colour. All the mucous membranes are injected and reddened during the height of the inflammation, but gradually resume their normal appearance in cases which terminate favourably, and become leaden in appearance in cases which terminate fatally. It is possible for an animal to live for eight or nine hours after gangrene has set in, but usually death occurs in an hour or so. When diarrhœa is present as a symptom the practitioner may know that he has the worst form of enteritis to deal with, and the chances of a fatal termination are very great as compared with those of recovery.

Treatment.—The treatment of enteritis is anything but satisfactory—a cure being but very rarely effected. If the case be subjected to treatment in the earliest stages, and the animal is in a plethoric condition, a copious abstraction of blood may be attended with benefit. Fleming's tincture of aconite may be given frequently and in large-sized doses, ♏ x.—♏ xv., every two hours. Experience teaches that the horse will stand larger doses of aconite when suffering from enteritis than in any other disease. The most reliable remedy in the treatment of enteritis is opium, which is justly said to be the sheet-anchor in the treatment of this disease; Opii Pulv. ʒi., may be given every two or three hours, and serves the double purpose of keeping the bowels quiet and relieving pain—two very important points. In some cases the alkaloid may be given hypodermically. Some practitioners recommend placing the patient under the influence of chloroform, but the efficacy of chloroform in the treatment of enteritis is, to say the least, very doubtful. Enemas of tepid water may be given, but not nearly so freely as in colic. Counter-irritation to the abdomen is of undoubted value. Mustard, ammonia, hot water, etc., may be applied, and a pretty good surface should be covered. It is a point of the utmost importance that the patient be kept warm, especially during the winter, hence he should be judiciously clothed, and protected from draughts of cold air, but at the same time allowed plenty of fresh air; the general comfort of the patient should also be attended to. As a rule, purgatives are inadmissible, but occasionally a case may be met with in which a good oleaginous purgative may be productive of the greatest benefit. When the disease has reached an advanced stage, and the inflammation has relieved itself by a copious exudation, the only chance of recovery depends upon the careful administration of opium in some of its forms, the powder being the best. Mild diffusible stimulants may also be given in conjunction with the opium. If recovery occurs, the animal should be fed on small quantities of easily digested food, and used carefully for some time.

VOLVULUS

Volvulus is a condition not uncommonly met with, and consists of a portion of intestine which has become twisted in some way or other. It usually occurs during colic, particularly spasmodic colic. It may also be due to the presence of pedunculated mesenteric tumours, which press upon and interfere with the intestines. The ilium is most frequently affected, hence the name 'ilius' is sometimes applied to the condition. Young animals appear to be more liable to an attack, and suffer more frequently than old animals.

Symptoms.—It is almost impossible to form a correct diagnosis in this trouble. The symptoms are somewhat similar to enteritis, but are not so violent, and are more prolonged. Examination *per rectum* is sometimes of assistance in diagnosis. There is also a peculiar sighing, or catching of the breath. The usual signs of abdominal disease are present, as pawing, rolling violently, etc., and another symptom is sitting upon the haunches after the manner of a dog; when this is seen, in forty-eight hours or so from the beginning of the attack, death is almost certain.

Treatment.—As a rule, treatment is of no avail. However, a case may occasionally be cured, the treatment consisting in the administration of hypnotics to allay pain, in addition to which a dose of oil may be given. The animal should be kept perfectly quiet. When it is seen that a case is certain to terminate fatally, the animal should be destroyed to end its suffering.

INTUSSUSCEPTION

By intussusception is meant the slipping of a portion or whole of a bowel into the cavity of another bowel. There may be only two or three inches, or many feet, of bowel invaginated. It is a condition rarely met with, but when it does occur is very serious, and usually results fatally. It may occur in either the large or small intestines, although the latter in all probability are those most frequently involved.

Causes.—It is not always an easy matter to account for the occurrence of this condition. Violent intestinal contractions, such as take place in a severe attack of spasmodic colic, will produce it. It is of most frequent occurrence among young animals.

Symptoms.—The symptoms of intussusception are about the same as those of volvulus.

Treatment.—Treatment is the same as for volvulus, but is generally useless. Purgatives are inadmissible. Some practitioners recommend the performance of a surgical operation to relieve the condition, the method suggested being to cut into the abdominal cavity, and having searched for and found the imprisoned portion of bowel, to free it. Such an operation, under strict antiseptic precautions, gives excellent results in the smaller animals, and, if the diagnosis can be certain, should be tried in the horse as a last resort before the patient is too much exhausted. Sometimes the invaginated portion of intestine may slough off and come away with the fæces, and recovery take place.

INTESTINAL TUMOURS, Etc.

Tumours of a small size sometimes exist for a long time in connection with the intestines without giving rise to any inconvenience whatever, but as they increase in size they begin to cause more or less trouble, especially if the animal be fed upon certain kinds of food. If inside the intestine the passage finally becomes blocked, and death ensues. Tumours, particularly lipomas (fatty tumours), are sometimes met with in connection with the bowel or mesentery. They may exist for a long time without causing trouble, but if the pedicle becomes twisted over the gut it may cause obstruction and death.

Hernia, Intestinal.—By intestinal hernia is meant the passing of a portion of intestine through the mesenteric membrane. The resulting pain is not very great, but death is certain, unless the gut can be returned.

Symptoms.—The general symptoms of intestinal tumours, constrictions, cul-de-sacs, herina, etc., are colicky pains. The patient paws and rolls, throws himself about, but not so violently as in a well-marked case of colic. The pulse is not so full and bounding as in a case of enteritis, and it gradually becomes quicker. There is always obstinate constipation. Sometimes the patient sits upon its haunches. The pulse becomes quick and weak, the eye takes on an amaurotic stare, the body and extremities become deathly cold, cold sweats bedew the body, and death soon follows. As a rule, the animal lives for two or three days after the first appearance of the disease. During life it is difficult to tell exactly what the trouble consists of, and such knowledge can only be obtained by making a post-mortem examination, when some satisfactory explanation may be found for the cause of death.

Treatment.—To relieve pain sedatives, such as opium, morphia, cannabis, etc., as for colic, but death usually occurs. The difficulty of making an accurate differential diagnosis makes operative interference a procedure for very serious forethought, otherwise the removal of most of these tumours, when once they are found, does not offer serious difficulties if strict antiseptic principles are adhered to. The chief difficulty is to diagnose the case and afterwards find out the exact situation of the tumour or hernia.

INTESTINAL CONCRETIONS

Intestinal concretions, or, as they are frequently called, abdominal calculi, dust-balls, etc., consist of formations or masses of hard material, usually round, or nearly so, in shape, and formed of salts of lime, magnesia, hair, etc. The name 'dust-ball' was given to these concretions from the fact that they are most frequently found affecting horses that are fed upon the sweepings of flour mills. These concretions are formed in the intestinal canal. Usually there is a piece of brass, iron, stone, oat, or something of that sort, which forms a nucleus around which foreign bodies collect and adhere, until the mass attains a large size and usually causes death. Sometimes calculi of an enormous size have been expelled from the bowels by the aid of enemas, etc., and the animal's recovery effected. Balls composed of hair are sometimes seen in pigs, are also found in cattle in connection with the reticulum, and occasionally a horse may have a hair ball. They are formed as a result of the common habit animals have of licking themselves and each other, a certain portion of hair being drawn away by the tongue and swallowed, until after a time a hair ball is formed of considerable proportions. These balls may exist within the intestinal canal for a very long period and not seriously inconvenience the animal; but when they attain any very great size they interfere with digestion, and finally, unless expelled, cause death.

Symptoms.—The animal manifests uneasiness, and appears to be suffering from an attack of colic, for which disease he may be treated, and recover only to be attacked again at some future time. A peculiar sighing sort of respiration may be noticed during the continuance of the attack; the pulse runs down; obstinate constipation is present; and inflammation may set in. The patient in this disease also shows the peculiar symptom of sitting upon his haunches. This symptom is to be regarded as a bad sign when occurring after the animal has suffered for any length of time; and it may be regarded as incidental to rupture; however, it is not to be regarded as an infallible sign of death. When the bowels become inflamed, owing to the presence of calculi, all the symptoms of enteritis are presented—as rolling, pawing, quick pulse, constant pain; cold sweats break out upon the body, and death follows.

Treatment.—The practitioner should carefully examine as to the state of the rectum. As a rule, removal of the contents of the rectum with the hand, or 'back-raking,' as it is commonly called, is not to be recommended, as it may give rise to a considerable amount of irritation, particularly if performed in a careless manner, or if the operator possesses a large hand. But back-raking must be done under certain circumstances, and this is one of the conditions in which it may be productive of good results. Enemas of tepid water and soap should be freely given. In case there is much pain opiates should be administered, and the calculus may pass on until it enters the rectum and comes within reach of the hand, when injections of tepid water may be given to empty the rectum of fæces, after which the hand and arm should be thoroughly lubricated with vaseline, lard, or olive oil, and a quantity of oil may also be forced into the rectum to lubricate its walls and facilitate the removal of the calculus. The hand should now be gently passed into the rectum and the calculus seized and gently removed. Strong purgatives are inadmissible, inasmuch as they are likely to cause rupture of the bowels.

CONSTIPATION

Constipation may be an accompanying symptom of disease or a disease in itself. It is also observed when intestinal concretions are present in the bowels. It causes an undue accumulation of fæces, and may be due to too great or rapid absorption of the fluids of the intestinal canal, as is often the case in febrile disorders. Derangement of the liver, feeding on certain descriptions of food, as Indian corn, pea-straw, or any kind of very dry food, all tend to cause constipation. Another cause is feeding upon food of a highly nutritious character, as oats, beans, etc., and not allowing the animal a sufficient supply of coarse bulky food, as hay. Inferior food may also produce it. It may also follow indigestion, or any derangement of the digestive system. It is most frequently seen occurring in old animals.

Symptoms.—The condition, as a rule, is easily detected. There may be a slight diarrhœa at the commencement of the attack. This is about the only symptom that is likely to mislead the practitioner. The diarrhœa soon ceases, and if fæces are passed they are seen to be in hard pellets, and perhaps coated with mucus. The animal has a dull appearance, and is sluggish in his movements. Abdominal pain is manifested in the usual way, and may be caused by slight spasm. He rolls and paws, but not in the violent manner of colic, and it is evident that the pain is much less than in a case of colic. There may be slight flatulency, giving rise to tympanites, and explaining the presence of the pain. The fæcal matter usually accumulates in the large intestines, most commonly in the colon, and sometimes in the rectum, in consequence of which, and more particularly if the constipation be caused by inferior food, the intestines may become partially or wholly paralyzed and distended, the muscular fibres lose their contractile power, and the animal becomes totally unable to expel the fæces. A symptom often noticed when obstinate constipation is present, more particularly when in connection with the large intestines, is a tendency on the part of the animal to back his buttocks up against the wall or manger and press upon the parts, probably in an endeavour to relieve pain. Another symptom is more or less protrusion of the rectum, which may also be found to be in a highly irritable condition, caused by frequent straining on the part of the animal whilst endeavouring to expel the fæces.

Treatment.—The treatment of constipation must be prompt, energetic, and careful. A cathartic medicine should be exhibited, aloes being best for horses, Epsom-salts or oil for cattle and sheep, and castor-oil for the dog. Carminatives should be combined with the purgative to prevent griping. Enemas should be freely employed, to remove all hardened fæces from the rectum and the colon. Nerve stimulants, as well as diffusible stimulants, will be found highly beneficial, particularly if the occurrence of paralysis of the bowels is feared. Tobacco smoke, enemas, or injections of a decoction of tobacco and lard, are of the greatest service. The hand and arm, after being well lubricated, may be passed into the rectum and the hardened fæces removed, if any are present. It may be necessary to remove the fæces with the hand every day for a week or two, if there is partial or complete paralysis of the rectum.

Calomel or croton-oil should never be used. In chronic constipation change the food, give roots, grass, etc., nerve stimulants, Sodæ Bicarb., tonics, etc.

DIARRHŒA

Diarrhœa consists of the passage of an undue quantity of liquid fæces. It is common amongst horses and cattle, and, in a majority of cases, occurs as a symptom of some other disease, as acute indigestion, enteritis, etc., but also occurs as an independent condition. There is always more or less congestion of the bowels in a case of diarrhœa.

Causes.—Diarrhœa may be caused by giving rich and succulent food to an animal that is not accustomed to it; the incautious use of purgatives is another cause, producing superpurgation, which is one of the worst forms of diarrhœa. The use of stagnant or putrid water for drinking purposes, and grazing on a poor sandy pasture (in which case the animal usually swallows more or less sand), cause diarrhœa, as will the presence of any irritant within the bowels, as turnips, carrots, or any other roots, if mouldy, putrid, or frozen. Raw potatoes induce a very serious form of the disorder. Violent exercise may also be followed by an attack, probably as a result of indigestion. Simple diarrhœa is oftenest seen in horses of weak conformation, as those animals having weak loins, with a considerable space between the last rib and the antero-external spine of the ilium, a narrow flat-sided chest, etc.; such animals are commonly described as washy. Diarrhœa is not usually a fatal disease when it occurs in the simple and uncomplicated form, and often may be regarded as a curative process, inasmuch as in those cases where irritant substances, such as sand, etc., have been swallowed, diarrhœa may be regarded as nothing more than an effort of nature to expel the offending agent. Cases have been noticed in which as much as a pailful of sand was expelled from the bowels by this process. It is one of the most rapidly debilitating diseases with which the profession is acquainted. When a case of simple diarrhœa continues too long, or occurs in connection with, or as a sequel to, a debilitating disease, as influenza, pneumonia, etc., it becomes an extremely serious condition, and unless speedily controlled will undoubtedly result in the death of the animal.

Symptoms.—There is an undue quantity of fæcal matter discharged, which, instead of presenting a normal appearance, is liquid, and may be ejected in a violent manner, or, in some cases, may be seen trickling down the legs, escaping involuntarily from the anus. After defecation, slight griping pains may be manifested by the animal, the pulse at first does not show much change, but if diarrhœa persists for a day or two the pulse becomes quickened and weakened, the ears, extremities, and body become colder than in health, and after awhile the animal may stagger in his gait. Excessive thirst is manifested, and anorexia, either partial or complete, soon occurs. If not checked it may terminate in enteritis or death from exhaustion.

Treatment.—If possible, the practitioner should ascertain the cause of the trouble. If due to the presence of an irritant, it is not safe to check it suddenly, but in a case characterized by debility and weakness of an alarming character, it should be checked as soon as possible, regardless as to whether the whole of the irritant substance has been expelled or a portion is yet retained. If weakness be not too great, and it is suspected that the diarrhœa is a result of the presence of some irritant substance in the intestinal canal, it is good practice to administer a mild oleaginous laxative, and in case much pain is manifested, opiates in the usual-sized doses may be added to the draught. If weakness be observable, a good diffusible stimulant, as Spts. Æth. Nitrosi, may be given with advantage. The ordinary colic draught will usually answer the purpose. Counter-irritation to the abdomen may be necessary in some cases. In cattle, Magnesia Sulphat. should be given in preference to any other laxative. In cases where great weakness is noticed, and it is evident that it would not be safe to administer a laxative, the discharge must be checked as quickly as is consistent with safety. For this purpose the practitioner may administer Opii Pulv. ʒi., or Opii Tr. ℥i.—℥ii., preferably in doses of ʒi., to be repeated at suitable intervals until the desired effect is produced. Catechu and powdered chalk are good also, and may be given in the ordinary quantities. An excellent draught is the following: Opii Pulv., Camphoræ, Rhei Radix Pulv., āā. ʒi., in a pint of ale twice a day, or oftener, according to the judgment of the practitioner and the urgency of the case. Cattle require relatively larger doses than horses. Flour, starch, etc., in water, are often used with good results. The inordinate thirst which generally accompanies diarrhœa should not be gratified, but the animal should be allowed regulated quantities of water with the chill taken off. Wheat-flour gruel is also very useful. If the rectum is irritable, inject opiates to allay pain or relieve the irritation.

Diarrhœa in Foals.—Diarrhœa is of very common occurrence among foals, when they are only two or three weeks old, and may be caused by cold, fatigue, unsuitable food, or by some peculiar condition of the mother's milk. In cases where the mother has received a dose of cathartic medicine and the colt has been allowed uninterrupted access to the milk, the young animal is almost certain to be attacked by purging, more or less violent.

Symptoms.—The symptoms are very similar to those of diarrhœa in the adult animal. The fæces are liquid and passed in excessive quantities, are of a yellowish white colour, and usually mixed with little hard lumps. The colt rapidly falls off in condition, becomes hide-bound, the coat staring and dusty looking, the belly tucked up, and griping, either of a mild or severe character, occurs. The patient may be observed to grate its teeth with pain; soon great weakness becomes manifest, the colt staggers in his gait, and, unless quickly relieved, dies.

Treatment.—The treatment of diarrhœa in foals is often difficult, as they do not stand medicine so well as adult animals. The following may be given to the foal if it is a good-sized, strong colt: Ol. Ricini, ℥i.—℥ii.; Opii Pulv., Rhei Radix Pulv., Cretæ Præp., āā. grs. xx. The practitioner should, however, be very careful in administering opium to foals. The mother should be given a diuretic, and if her milk is too rich, she should be reduced in condition; in case the milk is not rich enough, she should be fed well both as regards quantity and quality of food—the general health of the mother being the most important point to attend to—and she should be kept in a state of health as nearly perfect as possible. Mild counter-irritation to the belly of the foal is often of benefit.

If the diarrhœa is suspected to be due to micro-organisms in the intestinal canal, antiseptics, such as hyposulphite of soda, chinosol, carbolic acid, or izal are useful.

DYSENTERY

This term is applied to a condition in which there is a bloodstained diarrhœa. It may be merely an accompanying symptom of another disease, or it may occur as an independent affection. No part of the intestinal tract is exempt from an attack, although the large intestines are more commonly affected than the small intestines. The disease is more commonly met with among cattle than horses, and oftenest seen in well-bred cattle; in such cases it is often found in connection with tuberculosis of the intestinal tract. The presence of irritants in the intestinal canal, as sand, poisonous substances, etc., will cause it. It sometimes arises from grazing on marshy wet lands, or from drinking impure or stagnant water.

Symptoms.—As in the simple form of diarrhœa, the evacuation of fæces is of a liquid character, but tinged with blood, and on examination may be seen to contain shreds of mucous membrane. Griping pains are experienced by the patient, and partial or complete anorexia is an early symptom. Pyrexia becomes well marked, the pulse quickened, and the patient is possessed of an inordinate desire for water, more or less extensive ulceration of the bowels may take place and cause hæmorrhage, which in some cases is very profuse and of an alarming character; the strength rapidly fails, the flanks present a hollow appearance, the countenance becomes haggard, the coat dry and hot, and death soon ensues.

Treatment.—The treatment, to be successful, must be prompt and energetic. A mild oleaginous laxative (castor or linseed oil) may be given, after which every endeavour must be made to check the diarrhœa and obviate the danger of hæmorrhage. For this purpose prepared chalk, opium in its various preparations, diffusible stimulants—as ether, brandy, or whisky—may be administered. Some practitioners recommend the administration of codliver-oil in small and repeated doses. Lead acetate is also recommended; it is a powerful astringent, and if given, it should be in doses not to exceed grs. xl. three times daily. Catechu, tannic acid, flour, starch, etc., are all used in the treatment of dysentery, but an astringent should never be given in the very early stages of the disease. If the practitioner succeeds in arresting the disease in its course, and the patient begins to improve, tonics should be given—any of the ordinary mineral or vegetable tonics will do—the food should be allowed in proper quantities, and should be of the most nutritious character, the drinking water pure, and the general health attended to.

HERNIÆ

A hernia may be defined to be a protrusion of the whole, or part of an organ through a natural or an unnatural opening. Abdominal hernia is a general term meaning protrusion of some of the intestines from within the abdominal cavity, either through a natural or an artificial opening—the latter form being distinctively known as ventral hernia. The other varieties of herniæ are named from the parts in which they lie, as inguinal, umbilical, scrotal herniæ, etc. Herniæ are further divided into reducible, irreducible, and strangulated. Any condition that interferes with the circulation of the part causes strangulation. Inguinal and ventral herniæ are not so common among the lower animals as in man.

Inguinal Hernia.—Inguinal hernia is most commonly met with amongst stallions and young animals. It consists of the passage of a portion of intestine through the internal abdominal ring into the inguinal canal. Sometimes the intestine passes down and becomes slightly strangulated, producing colicky pains. The animal rolls, gets up, and is all right, the intestine having returned to its place. Such an occurrence being frequent should lead the practitioner to suspect the presence of hernia. It is, however, a somewhat difficult condition to diagnose, as there is no external sign of the existence of a hernia of this description, and the only way in which it can be detected is by a careful and thorough examination of the parts. Castration tends to prevent the occurrence of inguinal hernia, as then the inguinal canal becomes smaller, the spermatic cord retracted, etc. Hence it is of rare occurrence in the gelding, although it may occur both in the gelding and mare. In the bitch inguinal hernia is fairly common, the herniated organ usually being the intestine or uterus.

Scrotal Hernia.—Scrotal hernia is most common among young animals, in which it is often congenital, being frequently seen at birth, or soon after. In such cases the condition generally ceases to exist when the animal has attained the age of eight or nine months, and frequently disappears within a much shorter period: hence it is better to leave such cases alone so long as they cause no inconvenience, and are likely to disappear of themselves. Scrotal hernia may exist for a great length of time without causing very much inconvenience, but when it becomes strangulated or causes much inconvenience, it is necessary to treat it.

Symptoms.—It is frequently a matter of considerable difficulty to state positively whether hernia is present or not: the enlargement may be there, but is it intestine, or something else? If it be a true hernia it will increase in size after a hearty meal. It is also influenced by the weather, heat, by relaxing the tissues, allowing the hernia to expand to its fullest extent, while cold causes it to contract. A diagnostic symptom is as follows: The practitioner should place the hand upon the suspected mass, taking a firm but gentle hold; an assistant should now be directed to cause the animal to cough. If it be a portion of bowel, it will be slightly drawn up when the animal coughs. It is usually soft and fluctuating beneath the fingers. It is caused by violence, such as may occur to stallions whilst covering mares, leaping, running, etc. In many cases a slight amount of manipulation is sufficient to return it to its place. As it is so frequent in young colts, the practitioner should always examine for the condition before castrating the animal. If hernia be present, and proper precautions are not taken, the bowel may escape and descend even to the ground, in the event of which great difficulty is experienced in returning the intestine, securing it in its place, and curing the animal.

Treatment.—Various methods of treatment are pursued. For instance, some practitioners recommend the application of a bandage or truss, but such a procedure is objectionable on account of the difficulty attending its proper application, and retention afterward. Another, and a very good way, is to cast the animal, and by gentle manipulation, etc., return the intestine to the abdominal cavity, after which, take hold of the testicle, apply clams over the scrotum and allow the mass to slough off. If, however, the hernia is of a very large size, the owner should be carefully informed beforehand of the increased risk. In cases where the hernia is of a very small size, the best operation is that known as the covered operation, and consists of cutting through the scrotum and the other coverings of the testicle until the tunica vaginalis is reached. This tunic should not be interfered with. The hernial sac being exposed to view, an incision must be carefully made into the stricture, discovered by means of the finger, after which the bistoury should be passed in through the opening and the stricture divided. In a great many cases the bowel will at once pass back into place of its own accord; if it does not, it must be returned with the hand. This done, the scrotum, with the cord, etc., should be placed in clams, the clams closed, and the mass allowed to slough off, during which process a considerable exudate is thrown out and new flesh is formed. Very good success in the treatment of scrotal hernia in colts may be had by simply puckering up the scrotum and stitching it to retain it in that shape. When clams are placed over the scrotum, they should not be put on too tightly, or sloughing will take place sooner than is desired; hence, as it is desirable for the process of sloughing to extend over a period of ten days or so, the clams, if possible, should be placed on in a rather loose manner, and prevented from slipping by passing a skewer through the tissues below. If a case of hernia is met with occurring in a stallion, after casting the animal and returning the intestine, clams may be placed over the scrotum beneath the testicles, a portion of the scrotum allowed to slough off, and relief afforded.

Strangulated Hernia.—When a portion of intestine protrudes from the abdominal cavity and becomes strangulated, the animal acts very much as though suffering from an attack of colic—pawing, rolling, turning his head to the parts, and, in some cases, almost touching the scrotum with his nose; sweats break out, etc.

Treatment.—Relief may occasionally be afforded by casting the animal, turning him upon his back, elevating the hind-quarters, and manipulating the parts. Taxis is recommended in the old works, but it is objectionable for reasons that are obvious to every practitioner. In some instances gas is generated in connection with the strangulated mass, in which case the parts become troublesome to handle, and it may be necessary to puncture, using for the purpose the small trocar and cannula which usually accompany hypodermic syringes. If there is a well-marked constriction, which prevents return of the intestine, the stricture must be divided. Before operating, the animal should receive a day or two of preparation, by dieting carefully, etc., and if in very high condition, or carrying much surplus flesh, he may be given a dose of cathartic medicine and a few diuretic powders. In exceptional cases the clams slough off and the bowel escapes, the opening never having closed.

Such cases are, however, very rare. In all cases the operator should be careful to not includ[illegible]ion of the intestine within the clams. If such [illegible] t[illegible]uld happen, the animal, on rising, will immed[illegible] great pain, and must, of course, be recast at [illegible] the imprisoned portion of intestine released, or t[illegible] n[illegible]rious results will occur. After operating, the ani[illegible] be kept standing quietly in the stable for a few da[illegible] may be given walking exercise, but no [illegible] should be allowed until recovery is complete.

Umbilical Hernia.—This form [illegible] her[illegible]sts of the protrusion of a portion of bowel or omentum through the umbilicus. Although umbilical hernia may exist in any animal, it is more frequently met with in young ones than any other. It does not, as a rule, appear to cause any inconvenience, and is generally reducible. There is danger of the hernia becoming strangulated, but such danger is slight. It may often be reduced by pressure. It is recommended by some practitioners to apply a truss, or an ordinary broad bandage, extending round the body in such a way as to press upon the hernia, the chief objection to these appliances being the difficulty of keeping them in place. Plasters have also been recommended, but may cause irritation. Another method pursued is to return the bowel, pass skewers through the skin, and apply a ligature around the skewer in the shape of the figure eight. Clams are also used. It may be overcome in all the ways mentioned. Another method, often practised with success, is to cut into the hernial sac, scarify the edges of the abdominal opening, bring them together, secure in place with catgut sutures, and place a bandage over all.

Ventral Hernia. — This variety of hernia consists of the protrusion of the whole or a portion of a viscus through an artificial opening in the walls of the abdomen. The protrusion may be very small or very large. It is very rarely caused by violent exertion, but occurs usually as the result of direct injury, such as being gored by a cow, or from a blow or kick. The practitioner should always search for these enlargements when examining a horse as to soundness. In an old animal hernia may occur in consequence of the abdominal muscles giving way without any apparent cause for doing so. In opening abscesses in this region the practitioner should be careful, as in case hernia exists in connection with the abscess, the intestine may be wounded, and death of the animal result in consequence.

Treatment.—If small, it is always advisable to refrain from treating this variety of hernia, unless it becomes strangulated, increases in size, or in some way interferes with the animal or his usefulness. In case the owner insists upon an operation, the clams should be used as a rule, but if it is of large size the best method of procedure is to cut into the abdominal wall, scarify the edges of the opening, bring them together, suture, and bandage. A cure usually results.

Diaphragmatic Hernia.—In diaphragmatic hernia the bowels pass through the diaphragm into the thoracic cavity. The condition, comparatively speaking, is rare. Cases have been observed, however, in which thirty feet of intestines had passed through the diaphragm. It may be caused by severe exertion, such as running, jumping, drawing very heavy loads, or by direct injury.

Symptoms.—The symptoms are not very plain, but such as are presented somewhat resemble those of enteritis, in addition to which there may be difficult breathing, very similar to that noticed in congestion of the lungs. This is caused by the presence of the intestinal mass in the thoracic cavity pressing upon the lungs and hampering them in their movements. The animal rolls about in agony, the body becomes bathed with sweat, the pulse is quick and weak, but sometimes may take on the character of the pulse of enteritis; the ears, body, and extremities become cold, and death takes place within a short time. Such a case may be mistaken for spasmodic colic, enteritis, etc.

Treatment.—It is invariably fatal, and treatment is of no avail.

PROLAPSUS ANI

This condition is also known as dropping of the fundament, protrusion of the rectum, etc. It may be caused by violent straining on the part of the animal, or by clearing out the contents of the rectum by a person possessing a large hand—particularly if the hand is not oiled, or the operation be performed in a violent manner. Anything that will irritate the rectum may produce this condition, as certain medicines, enemas, etc.

Symptoms.—A mass as large as the closed hand may be seen protruding. It presents a reddened appearance, and in cold weather quickly becomes gangrenous.

Treatment.—The protruding parts must be nicely bathed with warm water, and all hardened fæces removed from the rectum, preferably by means of warm water enemas, but in case the enemas fail, the hand and arm should be well oiled and passed into the rectum, when all hardened fæces found therein should be carefully removed, after which the protruding portion of the rectum should be gently forced back into place, the hind-quarters elevated, and the animal allowed very little food for a few days, and what is given should be of a laxative character, and readily digestible. If there is much irritation present, an enema of tepid water, with a small quantity of opium, should be given. Local applications of an astringent and anodyne character are also of great benefit, a very good application being the following: Powdered Opium, Oak-galls, āā. ℥i.; Lard, ℥vi., to be applied several times daily. This condition occurs in all animals. If a portion of the rectum becomes gangrenous, it should be removed by surgical methods.

RUPTURE OF THE RECTUM

Rupture of the rectum is quite a common injury, one prolific cause of which is the metal nozzle of the old-fashioned syringe. Mal-address in serving mares may also cause rupture of the rectum. There is a possibility of rupture in consequence of distension from gas, but such a cause rarely, if ever, operates in the production of the injury. It is a very serious injury, and, if occurring in the inferior part of the rectum, is almost certain to cause death; however, if it is situated in the superior part of the rectum, and posterior to the peritoneal attachments, recovery may take place. But if the rupture be situated anterior to the attachment of the peritoneum, death is almost certain to result. In either case, the practitioner, if he thinks there is any chance of saving the animal, should treat it.

Treatment.—The treatment consists in closing the rupture by means of the carbolized catgut suture. Give the animal very little food for a few days, and what is given should be nutritious and readily digestible. It may terminate in a recto-vaginal fistula if the patient be a mare, but death from peritonitis is the usual termination.

IMPERFORATE ANUS

This is a congenital condition in which the rectum ends in a cul-de-sac, or blind pouch, and has no external opening or anus. It is by no means uncommon amongst pigs, and may occur in all animals.

Treatment.—An artificial opening must be made in the proper place, the end of the rectum found, and drawn to the edges of the artificial anus, and stitched to keep it in place. Use some mild dressing, as white lotion, or carbolic acid lotion, to keep down irritation. Keep the patient quiet, and generally in a few days he will be all right.

CHAPTER XVIII

Diseases of the Liver

CONGESTION OF THE LIVER

DISEASES of the liver are not quite so common in the horse as in the human being, although all the changes which take place in the liver of the human being have been known to take place in that of the horse. But the horse, leading a more natural life than man, consequently suffers less frequently from this class of diseases than man. Diseases of the liver are hard to diagnose correctly. In post-mortem examinations we find well-marked signs of liver disease in many cases where no symptoms were presented during the life of the animal. Some of the causes of liver disease are: feeding the animal for a long time on a highly stimulating diet, hard work, and exposure to cold and heat. If the lungs or heart are impaired, the liver also becomes affected to a certain extent. Derangement of the liver also occurs in many cases as a symptom of other diseases.

Congestion of the liver occurs as a symptom of other diseases, as mentioned above. When occurring in consequence of functional derangement of the heart and lungs passive congestion of the portal and hepatic veins exists; besides which there may occur arterial congestion. It is most common in hot climates, and in horses that are pampered, and, having little to do, are fed upon food of a stimulating character.

Symptoms.—Affections of the liver, as already stated, are difficult to diagnose correctly, but the general symptoms of hepatic disease are usually well marked. In congestion the attack occurs rather suddenly, the animal becomes duller than usual, the bowels are observed to be in a disordered condition, and are perhaps alternately constipated and loose. Generally there is diarrhœa at the beginning of the attack. This is followed by constipation, the patient may have pretty severe colicky pains, and invariably turns the head towards the right side, the pulse is soft and weak in character, and all the visible mucous membranes are found to be of a yellowish tinge.

Treatment.—A full dose of cathartic medicine should be given. Calomel should not be administered in this condition. Give easily digestible food and diet carefully. Epsom-salts, ℥i.—℥iv. may be given night and morning for a few days. Congestion may end in inflammation of the liver. It is a common disease of sheep, and arises from feeding too freely on a stimulating diet, such as roots. In sheep the symptoms are loss of appetite, great lassitude, and dulness. The animal usually remains in pretty good condition, when suddenly death occurs, and a post-mortem examination shows congestion of the liver to have been the cause of death. The treatment consists in giving the sheep a mild laxative, as Epsom-salts, ℥ii.—℥iv. in water, and dieting the animal carefully. A course of potassium iodide is also useful; but sheep cannot be treated satisfactorily, as they do not stand medicine well in comparison with the other animals. Another common cause in these animals is the presence of the liver fluke.

HEPATITIS

Definition.—Inflammation of the liver. It is more likely to follow congestion of the liver than to occur as a result of anything else. It is possible that it is sometimes produced by feeding on coarse and inferior food. It may occur in either the chronic or acute form, and may involve a part or the whole of the gland. When the whole of the liver becomes inflamed, as a rule, a speedy and fatal termination may be expected; where only a part of the liver becomes inflamed, while it constitutes a serious condition, recovery may still take place.

Symptoms.—The animal is dull and languid, the coat staring, dry, and dusty in appearance, the pulse quick and weak, and the bowels are constipated, the fæces are devoid of colour, and in appearance like clay, the appetite is lost, but thirst is increased, the animal lies down, rolls, but not in as violent a manner as when suffering from colic; the breathing is quickened, the urine scanty, and often tinged with bile; the animal rises from the ground only to lie down again a few minutes afterwards; the acute symptoms may pass off, but more or less fever remains. The patient at this stage of the disease manifests extreme weakness, the mucous membranes have a yellowish tinge, and, in white-skinned animals, the skin takes on a yellowish hue; the brain may become affected sympathetically, and slight attacks of vertigo may be frequent; the fæces and urine remain in the condition described above, and lameness may also be present in the off fore-leg as a symptom.

Treatment.—The treatment of hepatitis is somewhat similar to the line of treatment pursued in congestion of the liver. Some practitioners advocate the practice of phlebotomy in the treatment of this disease, but it is not to be recommended. As a rule, a moderate dose of cathartic medicine may be given, conjoined with nervines, and mild diffusible stimulants, if the pulse indicates their administration; if not, a sedative may be given with benefit. Slight counter-irritation, as a mustard plaster over the region of the liver, is of great service. In some cases, when the acute symptoms have disappeared, potassium iodide may be given with benefit. The food should consist of nutritious and easily digestible material. Scalded bran is a very good description of food for a day or two. In those cases caused by high feeding the food should be reduced in quantity. The feeding of roots, as carrots, etc., is usually attended with gratifying results, and a run on grass is highly beneficial. The horse must be used very carefully for a long time after recovery. The disease is most likely to occur in the chronic form.

JAUNDICE

Jaundice, or, as it is very commonly called, the 'yellows,' is probably the most common of all conditions depending upon a disordered state of the liver. It is very common amongst highly fed and pampered dogs. It is not by any means a rare condition among horses. It can scarcely be regarded as a disease, as it is more properly a symptom of some of the diseases of the liver. It is, however, very generally spoken of and regarded as an independent disease of itself. It is often seen occurring as a sequel to debilitating diseases, as influenza, strangles, etc., and may be due to a stoppage of the bile-ducts, biliary calculi, etc. It may also occur as a symptom of torpidity of the liver. The principal symptom is the unnatural yellowness of the skin, and all of the visible mucous membranes. Any disease of the liver may give rise to this jaundiced appearance, particularly stimulation of the gland, by feeding largely, and giving insufficient exercise. Suppression or non-secretion of bile, in consequence of inflammation or functional inactivity of the gland itself, or the presence of any obstruction preventing passage of the bile through the ducts, may result in absorption of a portion of colouring matter, which, entering the blood, is distributed throughout the body, giving rise to the characteristic yellowish tinge. The urine is usually highly coloured with bile, the coat dry and staring, the animal exhibits considerable dulness and lassitude, and in the dog the tongue is furred, the breath offensive, etc. There are tests by means of which the practitioner can ascertain to a certainty whether the condition is caused by obstruction of the ducts, or is due to functional inactivity of the gland. Harley's test is as follows: Take of Acid Sulphuric Fort. ℥i., loaf sugar a sufficient quantity; add the urine to the sugar, then add the sulphuric acid slowly, and, if the trouble is due to obstruction, the mixture will become a scarlet or purple-red at the line of contact; but if a brown colour be presented at the line of contact, proof conclusive is obtained that the trouble is due to suppression. This test is thoroughly reliable.

Treatment.—If the test reveals nothing more than functional activity of the liver, an aloetic cathartic, combined with calomel, should be given. In case the test indicates obstruction, the administration of liver stimulants is contraindicated, as likely to be productive of harm.

CIRRHOSIS

Cirrhosis, or induration of the liver, may occur as a result of hepatitis, but its most common cause is feeding on coarse or inferior or damaged food, particularly poor hay, sudden and frequent changes from food of a poor quality to a highly stimulating diet, etc. It is of greatest frequency amongst old animals. In man the same condition follows the long-continued use of alcoholic stimulants, hence it has been called gin-drinker's liver.

Symptoms.—The symptoms are those of general liver disease, the animal gradually falling off in condition; the coat becomes staring, dry, and dusty looking; clay-coloured and very fetid fæces are passed; there is a weak pulse, and at first a variable appetite, which gradually fails until anorexia becomes complete; the animal becomes greatly emaciated, and, as a rule, persistently retains the standing posture to the last, lingering along until finally death takes place. The mucous membranes, and—if the horse be white—the skin take on a well-marked yellowish tinge. On placing a small portion of the fæces on a piece of white paper, a stain will be left similar to that of opium.

Treatment.—Great difficulty is generally experienced in arriving at a correct diagnosis, mistakes are frequent, and the patient usually dies. Sodium or magnesium sulphate should be given in judicious quantities; mineral acids should also be tried, and followed by a course of tonics. The food must be changed, and should consist of the best quality, given in proper quantities and at regular intervals. Exercise, if not overdone, will be very beneficial. A radical cure can never be made, but the patient, by proper treatment, may be greatly benefited.

Rupture of the Liver.—If the rupture be one of considerable extent, death will surely result within a short time, but if the rupture be of small size, and the capsule remains intact, recovery may take place. It is almost impossible to diagnose the condition. The treatment would be the internal administration of styptics, perfect quietude, a course of mineral acids, proper dieting, tonics, etc. The animal shows more or less pain, the pulse is found to be irregular, and rapidly running down. In cases where there is much internal hæmorrhage the mouth is cold and clammy, the body and extremities become very cold, the mucous membranes become blanched, cold sweats bedew the body, and, as a rule, death quickly occurs.

ROT IN SHEEP

The condition known as rot in sheep is due to the presence of a parasite ('Distoma hepaticum'), the common liver fluke. It occurs very rarely in the horse, or other animals, except cattle and sheep, the latter suffering most frequently. These parasites vary in size, from one-half to rather more than one inch in length, and are sometimes met with two-thirds of an inch in width. They live on the tissues of their host, and consequently may produce fatal results. They are the cause, and not the result, of disease, as some people suppose them to be. On an examination being made of the bile-ducts of an affected animal, great numbers of these parasites may be found choking up the ducts, and surrounded with masses of ova, which gradually descend into the intestines, and are passed out with the fæces, after which they obtain an entrance into the soft-bodied molluscs found in stagnant waters. Thus it is that a wet season is so favourable to the development of these parasites, a dry season being disastrous to the development of the ova. The embryos are found to acquire considerable activity in the water, but pass into the molluscs, as stated above, and become encysted. The parasite reaches its host again when the sheep drinks the water containing the molluscs. The body of the mollusc, on reaching the stomach of the sheep, becomes dissolved, the hydatid escapes, reaches the liver, and deposits its ova, which go the same round of existence.

Symptoms.—The animal shows dulness and inactivity in a well-marked degree, and there is a yellowish tinge of the mucous membrane covering the sclerotic coat of the eye, best seen when the eyelid is pushed back. The abdomen becomes large and pendent, constituting the condition commonly called 'pot-belly,' the back becomes razor-like, the flanks tucked-up, and there may be observed a strong tendency to dropsical swellings in different parts of the body, and more especially about the throat; the animal's thirst is insatiable, and the pulse is quick and weak. Anæmia is a prominent symptom, the breathing is quick and short, and perhaps there is a slight cough, which may partly be caused by husk or hoose. The animal suffers from diarrhœa and great weakness, followed by stupor and death.

Treatment.—Early removal of the affected sheep to another pasture is imperative. A laxative should be administered, and the patient allowed plenty of food of a highly nutritive character, such as peameal, oil-cake, etc. It is essential that the animals be placed upon a very dry pasture, and watered from wells of considerable depth, to obviate the possibility of a further acquisition of parasites. As tonics, Ferri Sulph., Sodium Chlorid., Gentian, etc., may be given with benefit. In making a diagnosis, the practitioner should not omit an examination of the fæces for the presence of the parasite, or the ova, in a case of doubt. In Australia, where there was formerly much of this disease, there is now very little on account of the pastures being burnt over. The disease exists on the American continent, but so far has done very little harm.

BILIARY CALCULI

Biliary calculi occasionally exist in connection with some of the ducts, and are formed in the same manner as calculi occurring in any other part of the body. They do not occur with as great frequency among the lower animals as amongst the members of the human family. They are most likely to occur in an animal receiving a large supply of highly stimulating food and insufficiently exercised. When present in large numbers, they give rise to pain of a most excruciating character, and cause more or less dilatation of the ducts, obstructing the flow of bile, etc. Occasionally they may exist in large numbers without giving the slightest indication of their presence, apparently giving rise to no inconvenience whatever. Such cases, however, are rare. There is generally more or less indigestion, slight gastric irritation, and a yellowish tinge of the mucous membranes. The presence of the calculi may cause ulceration of the duct.

Treatment.—The animal should be given a course of mineral acids. Acid Hydrochlor., ʒii.—ʒiii., well diluted, should be given two or three times daily. The diet should be good, and of a laxative character. Very little more can be done but to exercise patience, and in course of time the calculi may, and very often do, pass down into the intestines, and escape in company with the fæces.

Tumours, etc.—Other conditions of the liver also occur as 'atrophy,' or wasting of the gland; 'hypertrophy,' or an abnormal enlargement of the liver. Abscesses, tumours, etc., may also occur in connection with the liver, but as these conditions have no well-marked symptoms peculiar to themselves, it is impossible to arrive at a correct diagnosis in all cases. Melanotic tumours occur in connection with the liver, and give rise to the general symptoms of liver disease, as gradual falling off in condition, irregularity of the bowels, a yellowish tinge of all the visible mucous membranes, etc. If these symptoms occur in a gray horse, particularly one advanced in years, and melanotic deposits are visible on any portion of the body, the practitioner is generally safe in diagnosing the case as one of melanotic tumour in connection with the liver.

Treatment.—As a rule, treatment of the conditions above spoken of is useless. The only thing that can be done is to get the system of the animal in as good condition as possible. The food should be of a nutritive and laxative character. Tonics, etc., may also be tried.

CHAPTER XIX

Diseases of the Spleen and Pancreas

CONGESTION OF THE SPLEEN

THE spleen is the largest ductless gland in the body. Its functions are not very well understood. Physiologists term it the grave of the red corpuscles, from the fact that large numbers of broken-down red corpuscles are found here, and that large numbers of white corpuscles are continually passing away from it to enter the general circulation of the body. The whole of the gland may be removed from the body, and the animal live for a time, but, as a rule, although the appetite is voracious, emaciation occurs and death in about a year, or less. Diseases of the spleen are not very common, but in all probability the gland suffers more frequently from disease than is generally supposed. It is undoubtedly more or less affected in all cases of 'miasmatic fever,' in 'splenic apoplexy,' and in 'Texas fever.' It is more liable to suffer from hypertrophy than from any other condition. Congestion of the spleen may take place, and run on until complete disintegration of the gland results.

In congestion of the spleen the organ becomes engorged with blood, and death may result very quickly, or the animal may live for several days and die; in other cases recovery may eventually take place.

Symptoms.—The symptoms of the condition as occurring in the ox are a weak and rapid pulse; the animal rolls and stamps violently, bellows, and evidently suffers pain of a severe character. He becomes gradually weaker, and may die within a few hours.

Treatment.—It is doubtful if treatment is of much efficacy, and any that may be employed should be more for the purpose of relieving pain, etc., hence opiates should be given. Aconite, in ordinary-sized doses, may also be of service. Each symptom as it appears should be combated according to its indications. Horses suffer with congestion of the spleen more frequently than other animals. The symptoms are, however, very vague and uncertain, and frequently it is impossible to tell what is the matter with the horse. It is most common in the Southern States of America, and on removing the animal to the North, or to any colder climate, there is observed in nearly every case a very great change for the better.

SPLENITIS

Splenitis, or inflammation of the spleen, is not very common, yet is occasionally met with affecting the horse, and is very likely to terminate fatally.

Symptoms.—The symptoms are often very similar to those of colic, but not so alarming in appearance, or so well marked as the symptoms of colic. There is a quick pulse, which, as a rule, is weak also. The animal at first shows more or less dulness, the ears droop, and the head hangs down—symptoms characteristic of debility and approaching dissolution. The respirations become increased, and the belly is tucked up. The condition is most frequently met with during the summer season.

Treatment.—Opiates should be given to relieve pain, counter-irritants should be applied over the region of the spleen, and a considerable surface invested. Any other symptoms should be combated as they arise, and according to their indications, and occasionally a cure may be effected. The spleen suffers far more frequently from chronic diseases than from acute diseases; it is liable to hypertrophy, as are all of the ductless glands. Rupture of the spleen may also occur, and causes death very quickly. This is usually from external violence.

HYPERTROPHY OF THE SPLEEN

The spleen may become enormously enlarged—in some cases attaining a weight of seventy or eighty pounds. Hypertrophy usually occurs as a result of some previous disease of the gland, particularly as a result of malarial diseases, and is most commonly met with in the Southern States of America, and in malarial or low-lying swampy districts.

Symptoms.—Negative symptoms, or the absence of disease in any other part, will assist the practitioner in arriving at a correct diagnosis. As positive symptoms there may be mentioned a peculiarly dull and languid appearance of the animal, unthrifty coat, falling off in condition, and the pulse may be slightly faster than normal.

It must not be forgotten that an enlarged spleen is one of the most characteristic post-mortem indications of anthrax.

Atrophy.—Atrophy, or wasting of the spleen, is occasionally seen.

Melanotic Deposits. — Melanotic deposits are sometimes found to exist in connection with the spleen; in fact, there is no portion of the body exempt from them.

General Symptoms.—The general symptoms of disease of the spleen are as follows: falling off in condition, which continues until the animal becomes frightfully emaciated, the pulse is slightly quickened and weak, the coat remains almost as sleek and smooth as in health, the appetite fails, the animal becomes weak, and is languid in all its movements; there may also be a slight fever, especially where the splenic trouble depends upon malaria. Enlargement of the spleen occurs, and if well marked it can be detected by a manual and visual examination of the region in which it lies; the breathing may be slightly quickened, and in some cases the bowels exhibit more or less irritability, and the animal cannot be got into good condition.

Treatment (general).—Treatment of the above-mentioned conditions is, as a rule, unsatisfactory. A dose of cathartic medicine may be given, and a change of food ordered. If enlargement of the spleen is suspected, the various preparations of iodine are likely to be of service. Potassium iodide should be freely given, but more good results from a change of climate than from anything else.

ANTHRAX

Anthrax, or splenic apoplexy, is principally seen in cattle. It is one of the most interesting to the veterinarian, as well as one of the most common and fatal diseases to which cattle are subject. The chief post-mortem appearance consists of an enlarged condition of the spleen, which may become four or five times the normal size, the blood in it being black and tarry in appearance. It is due to the presence in the blood of small rod-shaped micro-organisms —the anthrax bacilli. These can be readily demonstrated under the microscope by examining a drop of blood from the spleen or ear; the latter is now usually chosen in order to avoid opening the carcass. It must be examined before putrefaction has commenced. It is essentially a blood disease, the various constituents of the blood being altered, both as regards quantity and quality, and the blood as a whole undergoing a most remarkable change in appearance. The disease is characterized by its sudden attack, short duration, and usually fatal termination. It is readily communicable to other animals and to man.

Symptoms.—The symptoms are, as a rule, suddenly developed, and very alarming in character. An animal may be left at night in apparently a state of perfect health, and found the next morning dead. In some cases the disease comes on more gradually; the temperature becomes elevated, but such a symptom would never be observed unless in connection with something else. The ox suddenly refuses his food, and ceases to ruminate. There may be a well-marked chill. The animal shows more or lass uneasiness, which increases. Perspiration breaks out in patches over the body. The urine is scanty and of a very high colour. The pulse is very rapid and weak. Great debility quickly supervenes, the patient now beginning to stagger in his gait. The breathing is quickened, and, in some cases, appears to be difficult. The animal may strain violently in voiding fæces and urine. The brain seems to be affected in various ways, sometimes the animal quickly becoming comatose, and dying; in other cases the patient may bellow with pain, etc., froth at the mouth, and die in convulsions. Occasionally a recovery may occur without any treatment whatever being adopted.

Treatment.—In cases where the malady appears in a fully-developed and well-marked form, treatment is of no avail, for the reason that it runs such a rapid course that the proper medicinal remedies do not have time to exert their pharmacological effects before death occurs. And in those cases that are prolonged for several days, and finally recover, it is probable that nature plays the most important part in bringing about recovery. There is no medicinal treatment which can be said to be specific. The affected or suspected animal should at once be isolated and dosed with antiseptics, such as carbolic acid or creolin. Disinfectants should be used freely. An oleaginous laxative may also be given. The food and water should be changed, especially if foreign cake or corn is suspected as the carrier of the contagion. As the disease is communicable to man, the veterinarian should be very careful. Anthrax comes under the control of the Contagious Diseases of Animals Act, and must always be reported immediately to the proper authorities. The carcass should not be opened, or any blood spilled. Removal of an ear is quite sufficient for microscopical examination. The greatest care must be taken to guard against inoculation when disposing of the carcass, as many men have lost their lives through anthrax caught from a dead beast. Every part should be destroyed. Those who have to deal with foreign hides frequently become affected. It is known in man as 'wool-sorter's disease,' or 'malignant pustule.'

Pancreas.—Diseases of the pancreas are rare in man and beast. It is occasionally seen in the dog. Pancreatic disease may exist for a considerable length of time, and finally cause death without the true nature of the disease ever being discovered or suspected, until a post-mortem examination is made. Hence it may be seen that the symptoms are very vague and uncertain. There is really nothing beyond irregularity of the bowels and emaciation —symptoms which occur with many other diseases—to indicate pancreatic derangement. The occurrence of pancreatic calculi has been observed in the ox, but the symptoms are very obscure. Animals drinking water in limestone districts are subject to urinary calculi, and possibly the same cause may operate in the production of calculi in connection with the pancreas.

Treatment.—The treatment consists in a change of food and water, placing the animal on a course of the mineral acids, and the subsequent administration of tonics.

CHAPTER XX

THE OX

Diseases of the Stomach, Intestines, etc.

TYMPANITES

Tympanites, or, as it is frequently called, 'hoven,' 'dew-blown,' etc., is a very common condition affecting cattle, and consists of distension of the rumen with gases, the gases generated being sulphuretted hydrogen, carburetted hydrogen, carbonic oxide, etc., generated by fermentation of food, which may be due to the character of the food, or may be caused by functional derangement of the rumen.

Causes.—Tympanites may occur as a symptom of choking in the ox, and in such cases the condition appears very quickly. It also occurs in connection with parturient fever and chronic indigestion; frozen or partially decomposed roots, or inferior food of any kind, as mouldy hay or grain, will also cause it. Foreign bodies in the rumen, as rags, old bits of leather, etc.; diseases of the liver; clover frozen to a slight extent, or in a damp condition, and eaten, frequently give rise to the condition. Particularly is this the case in England and Scotland. On the American continent, however, wet clover is not a very common cause of tympanites, but it may readily be produced by feeding on slightly frozen potatoes or turnips, or by allowing a rich diet in too great quantities when preparing an animal for show purposes. Feeding on kitchen refuse, slops and potatoes, is the most common cause of hoven in towns. When occurring in an acute form, it does not arise from any diseased condition of the rumen itself, but is always due to the evolution of gases caused in some of the ways previously described.

Symptoms.—The symptoms are easily detected, and in many cases are of a very alarming character. The animal evinces more or less uneasiness, moves about from side to side, resting first upon one set of limbs, then changing to another set. Sometimes the animal gives vent to low bellowing at intervals of a few minutes. There may be eructations of gas. The left flank begins to enlarge gradually, but sometimes rises very rapidly until the side is forced up higher than the highest point of the lumbar spines, the antero-external spine of the ilium disappearing from view. There will now be a slight, or in some cases a copious, flow of saliva from the mouth. At this stage suffering of a severe character is manifested, the respiration is seriously interfered with, and the patient gives vent to a series of short grunts during expiration, persistently retains the standing posture, and manifests great unwillingness to move in any direction. Death usually ensues from asphyxia in those cases that terminate fatally. Sometimes death results from rupture of the diaphragm, or the rumen may be ruptured; rupture of the rumen is, however, very uncommon. In the latter stages brain symptoms are presented. The eyes protrude and are reddened in appearance. The tongue also is allowed to protrude from the mouth. The animal becomes excitable, and then delirious, falls or lies down, and dies within a few minutes.

Treatment.—The treatment of hoven should be prompt and energetic. Those remedies which unite chemically with and destroy the gases generated, and prevent the further generation of gases, should be employed. Ammon. Carb. ℥ss.—℥i. in water will very frequently have the desired effect. The following draught is also of great service in many cases: Ol. Terebinth. ℥i.—℥iv., Ol. Lini. ℥viii.—℥xvi., and follow with Magnesium Sulphat., lb. i.—lb. ii., Aqua q. s. to dissolve. Chlorinated lime and chlorate of potash are very useful, but the oleaginous draught above mentioned is preferable to all others. If the animal be seriously swollen, and it becomes evident that unless relieved death will occur before the medicines given can take effect, the condition must be relieved by passing the hollow probang into the rumen and allowing the gas to escape through it. Or, what is still better, by using the trocar and cannula to puncture the rumen, after which the trocar should be withdrawn, and the cannula allowed to remain until all the gas has escaped and the abdomen returned to its normal proportions. The operation should not be too long deferred, but should be performed while the animal has plenty of vitality. What is usually sold by instrument dealers as a cattle trocar is objectionable on account of its size, the ordinary horse trocar being preferable. The hollow probang is also good in cases where there is no great amount of ingesta in the rumen. After getting rid of the tympanitic condition a full dose of cathartic medicine should be administered, in combination with stimulants, as ammonia, whisky, etc. In tympanites produced by kitchen refuse, it becomes necessary to watch the case for a day or two, to prevent a return of the condition, and give tonics, etc.

IMPACTION OF THE RUMEN

This condition consists of the presence within the rumen of an excessive quantity of food, which, becoming impacted, partially or completely paralyzes the coats of the rumen. The impaction may be the result of one excessive meal, or may be due to the gradual accumulation of food in the rumen. It may be caused by the owner through mistaken kindness, feeding the animal largely, perhaps in compensation for a day or two of fasting. In some cases as much as one hundred and fifty pounds of food may be impacted within the rumen of an ordinary-sized ox.

Symptoms.—The condition may exist for several days before giving rise to any well-marked symptoms. About the first symptom noticed is either increasing dulness or uneasiness on the part of the animal. If a milch cow, she shows a falling off in the quantity of milk, the pulse is quickened, and rumination ceases; respiration is also quickened, the muzzle of the animal is usually found to be dry and hot, and the coat harsh, dry, and dusty in appearance. On making an examination of the region of the rumen, in many cases it may be seen to be slightly distended. This symptom, however, is not always present. The practitioner, by pressure upon the rumen, may satisfy himself as to its condition. If very full, the indentation caused by the pressure of the fingers upon the part will remain for some time after the hand is withdrawn. The rumen has a sort of doughy feeling under the fingers. There will usually be observed a flow of saliva from the mouth, and occasionally the condition may be mistaken for a case of choking, such a mistake being very easily made by an ignorant or inexperienced person. It is a very serious but by no means uncommon condition. On percussion the resonant sound given out in tympanites is found to be absent, and instead there may be heard a dull dead sound. As the case progresses and becomes worse, the pulse increases in frequency, the respirations become hurried, and the animal gives ven to a sort of grunt at the end of each expiration. Occa sionally, when the rumen is crammed to overflowing, there may be a slight regurgitation of food.

Treatment.—The treatment consists in the administration of powerful doses of cathartic medicines in conjunction with stimulants. Epsom-salts is perhaps the best cathartic for an ox, and in certain cases where it is desired to produce a speedy action of the bowels croton-oil and calomel may be given. Aloes may also be given in combination with the Epsom-salts, and frequently the addition of nux vomica is attended with great benefit. If the contents of the rumen cannot be removed by medicine, the operation of rumenotomy must be performed, and the impacted mass within the rumen removed mechanically. Under the local anæsthetic influence of cocaine, after thoroughly shaving and cleansing the skin and rendering it as aseptic as possible, make a bold slightly oblique incision through the flank between the last rib and the angle of the haunch. The skin and muscular tissue should be divided first, after which a smaller incision should be made through the walls of the rumen. A cloth which has been boiled or soaked in antiseptic should now be placed in such a way as to prevent the ingesta falling into the peritoneal cavity. The greater part of the ingesta should now be removed, after which the lips of the wound in the rumen should be cleansed and drawn together in place by carbolized catgut sutures; the external wound should be closed in a similar manner, but preferably with silver-wire or silk-worm gut sutures, and covered with iodoform colloid. As a rule, if the operation be properly performed and not too long deferred, it is successful. Occasionally abscesses form on account of septic infection at the time of operating or afterwards. After the operation the patient should be kept quiet and allowed food only in small quantities. The animal should not be allowed to take large quantities of food or drink, and should not be worried by the frequent administration of medicine, as the system is not in a condition to stand it, and much harm may result. Gruel, ale, whisky, etc., may occasionally be given to rouse the system. Enemas of tepid water are useful, both in connection with the treatment pursued before, and that pursued after the operation of rumenotomy has been performed.

VOMITION

Vomition takes place in the ox, and is sometimes seen as a symptom of some irritation of the rumen, or may occur in consequence of the presence of foreign bodies in the rumen or reticulum. All who are acquainted with the habits of cattle know that they have a great fondnes for chewing and swallowing all sorts of things. Old shoes scissors, etc., have been found in the rumen; and a cas is recorded in which a snake three feet eleven inches i length was drawn out of a cow's mouth. It is possibl for a portion of the food to remain in the rumen for six o seven weeks. This has been proved conclusively. An of the causes mentioned above may induce vomition. tumour in connection with the rumen or reticulum ma also give rise to vomition.

Treatment.—Give a laxative and follow up with bismu or soda, and in some cases that are obstinate, and in whi vomition continues in spite of all treatment, rumenoto should be performed if the presence of a foreign body the rumen be suspected. Acid. Hydrocyan. is very use to check obstinate vomiting, but must be used with disc tion on account of its toxicity.

Hair Balls.—Hair balls have been referred to bef They may be found in the rumen, but are more likely be found in the reticulum. They are formed of hair, usually caused by animals licking each other; they are particularly met with in calves. They gradually increase in size, and finally cause great irritation, giving rise to symptoms similar to those caused by the presence of any other foreign body. The treatment is the same, and they are very troublesome to get rid of.

IMPACTION OF THE MANYPLIES

This condition is also very commonly called 'fardel-bound.' The omasum is to all intents and purposes paralyzed. It may occur as an independent disease, or may occur as a symptom of some other diseased condition. Hence, although a post-mortem examination may reveal inflammation, or impaction, of the manyplies, the practitioner should not jump at the conclusion that either of these conditions has been the immediate cause of death. The food becomes tightly impacted between the leaves.

Causes.—Impaction of the manyplies may, as stated above, occur in consequence of the presence of some other disease, more particularly if chronic. Its secretory power becomes lost, and the food dries up and becomes impacted. It may also be caused by feeding on too dry food, or inferior food which does not contain nutriment in proportion to its bulk; and it may also be due to an insufficient supply of good water, etc.

Symptoms.—Usually the first symptom observed is loss of appetite, the animal appears slightly duller than usual, and, if a milch cow, she does not yield the usual quantity of milk, this symptom being one of the earliest presented. As a rule, the bowels are constipated, but sometimes there is slight diarrhœa, the pulse is quickened, the bases of the horns are hotter than usual, or alternately hot and cold, the muzzle is dry and hot, and the breathing quickened to a considerable extent. As the disease advances all of the above symptoms become increased in severity, and the animal now gives vent to a grunt at the end of each expiration, or may occasionally moan slightly. The patient may become excited in some cases, or even delirious, and, unless relieved, soon dies.

Treatment.—A powerful dose of cathartic medicine should be administered as quickly as possible, in conjunction with a stimulant, this being followed with diffusible stimulants, as ether, ammonia, or whisky. If much pain be present, opiates are to be given. In those cases where impaction of the manyplies results from inflammation of the true digestive stomach, powerful purgatives should not be administered. In such a case an oleaginous draught, with a proper proportion of Tr. Opii or Chlorodyne in it, may be given. As a tonic during the convalescent stages, sulphate o quinine, ℥i.—℥ii., may be administered twice daily for a few days. Enemas of tepid water containing common salt in solution, may be freely used during the acute stages o the disease, and are highly useful both to remove any hardened fæces that may be contained within the rectum, and t stimulate the bowels to action. Most cases of fardel bound are in reality cases of abomasitis, or result from abomasitis.

Colic, Spasmodic.—Cattle occasionally suffer from spasmodic colic. The nature, causes, symptoms, and treatmen are about the same as those of spasmodic colic in the hors

Enteritis.—Enteritis in cattle is much less frequent tha in horses. The nature, cause, symptoms, and treatmen are the same as in enteritis in the horse. The patie usually dies in four or five days, but occasionally may d in twenty to twenty-four hours from the beginning of t attack. Enteritis, however, is more amenable to treatme in the ox, and is not nearly so fatal as in the horse.

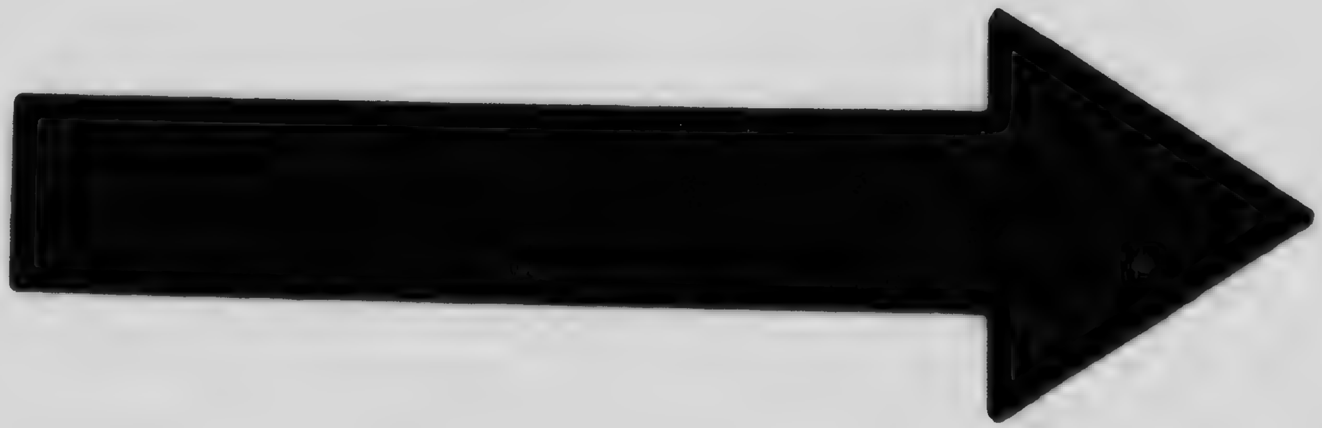
Dysentery.—The nature, cause, symptoms, and treatment of dysentery are the same in the horse and the ox. It is, however, of more frequent occurrence in the latter animal, and is very often associated with tuberculosis, or a diseased condition of the mesenteric glands. 'Protrusion of the rectum,' 'gastritis,' 'simple diarrhœa,' etc., also occur in cattle, the nature, cause, symptoms, and treatment of which are the same in the ox as in the horse.

WHITE SCOURS

This is a form of diarrhœa peculiar to young animals, especially calves, and is a very common disorder. It is highly contagious, and it is not uncommon for a whole herd to be swept off. The primary cause is, according to Jensen, an oval bacterium which gains entrance into the intestinal tract, and the weather may exert some influence in the cause of the disease. It is very commonly seen in calves fed and raised by hand, especially in those calves that do not get the first milk of the cow, but are fed on skimmed milk, or milk that is partly sour.

Symptoms.—The patient may lie down, but does not roll about. The fæces are semi-fluid, whitish in appearance, and have an offensive odour. The animal grates his teeth, and shows abdominal pain by stamping, curling of the tail, etc. During progression he may stagger slightly, or even fall, if the condition has existed for any length of time.

Treatment.—The first consideration must be the complete isolation of the affected calves. They must be put by themselves, and the places where they are and in which they have been should be thoroughly disinfected. If possible, avoid using the same shed or box again for at least twelve months. Let all fresh calves be put in a cart-shed, or some shed which is warm, well ventilated, and has



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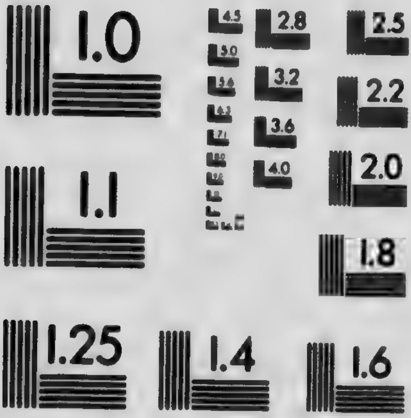

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never contained any affected ones. As regards treatment of those already affected, give a laxative dose of castor-oil and follow up by astringents, such as opium, chalk, or catechu. Powdered rhubarb mixed with light magnesia is very useful, as are also chlorodyne, oil of peppermint, and pepsin. Chinosol has proved very serviceable, and the treatment of the disease, now that the cause is known, by the administration of antiseptics internally is the most rational course. The recent researches of Nocard and Mettam in Ireland have confirmed its bacterial origin. The mother, also, should receive attention, and if her milk is too rich in quality she must be reduced; but if it be too poor in quality the mother should be fed upon a liberal quantity of easily digestible and highly nourishing food, given tonics, etc. This condition may also occur in calves, colts, and other animals, in consequence of sucking the milk of the mother when she is heated by exertion.

PERITONITIS

Definition.—Inflammation of the peritoneum. Peritonitis occasionally co-exists with enteritis, and is a very serious disease, whether occurring alone or as a complication of some other condition. It occurs as an independent disease, and may be caused in a variety of ways, as by exposure to cold, punctured wounds, etc.; it also follows castration, especially in cases where the animal struggles violently during the operation, and is exposed to the cold afterwards. It may also be caused by putting too much caustic on the clams. Any irritation of the peritoneum may cause peritonitis, and it very often occurs as a complication of metritis, constituting the condition known as metro-peritonitis.

Symptoms.—The animal stands the greater portion of the time, the pulse is from sixty to eighty per minute, and is wiry in character; the mouth is hotter than usual, the breathing is quickened, the eyes somewhat reddened, and there is present every evidence of intense fever; the patient shows signs of being in great pain, and the head is turned at short intervals to the flank, but the animal does not roll.

Treatment.—If well-marked peritonitis occurs, treatment as a rule is not satisfactory, a large majority of cases terminating fatally; however, there may occasionally be saved by proper treatment a case which would have terminated fatally if left to itself. Opiates by the mouth or hypodermically are of great service; tincture of aconite may also be of considerable service. If the paitent is very weak, stimulants are to be given in judicious quantities and at proper intervals. Apply hot fomentations, in the shape of blankets wrung out in hot water, continuously to the abdomen. To maintain the heat this should be covered with a dry blanket, and the whole covered with a piece of mackintosh sheeting. Counter-irritation in the form of stimulating liniments or mustard plasters is also very useful.

ASCITES

Ascites consists of the presence of a quantity of effused fluid in the abdominal cavity; as a rule it is symptomatic of some other condition, as diseases of the liver, kidneys, chronic peritonitis, etc. It is more frequent amongst dogs than horses or cattle.

Symptoms.—The coat is staring, dry, and dusty in appearance; the condition known as hide-bound is present, and the animal is dull and languid, sluggish in his movements, and presents an unthrifty condition generally; as the disease progresses, the pulse becomes quicker and weaker, and the abdomen becomes distended by the fluid accumulated within it. The appetite, as a rule, is but slightly impaired, the animal eating pretty well, but nevertheless grows weaker every day; the bowels are very irregular, diarrhœa and constipation being alternately present. Death may occur from asphyxia.

Treatment.—Diuretics should be freely given: potassium iodide in particular being the best drug to select; nerve stimulants may also be of great benefit. The diet should be of a highly nutritious character—light and easily digestible. In case no improvement takes place in consequence of the above treatment, it becomes necessary to have recourse to the operation of paracentesis abdominis, using a very small trocar and cannula for the purpose, or, what is better, an aspirator, by means of which entrance of air into the abdominal cavity may be prevented, a point of importance; convulsions may follow removal of the whole of the fluid, hence the patient should be carefully watched, and if symptoms are observed of an approaching convulsion, no more fluid should be withdrawn, at least, for a time. The other treatment may be pursued as though the operation had never been performed. As a rule the operation and other treatment give no more than temporary relief, a further effusion of fluid usually taking place.

GUT TIE

Gut tie, or strangulation of a bowel, is a condition occasionally noticed in working oxen.

Symptoms.—This condition is one very difficult to diagnose correctly. The animal grates his teeth, turns his head to his side, twists his tail in a peculiar spasmodic manner, and shows all the symptoms of abdominal pain;

small quantities of fæces may be voided, mixed with mucus, and occasionally with blood.

Treatment.—It is possible in some cases to relieve the condition by suddenly turning the animal over on its back, or by making it perform any sudden movement, as jumping, etc. However, it is usually necessary to cut into the side of the abdomen, find the strangulated portion of bowel, and straighten it out with gentle force, after which the wound in the abdominal walls should be closed by sutures, and treated as an ordinary wound, by antiseptic dressings, etc. If there is any pain expressed by the animal after the performance of the operation, opiates may be administered. In some cases the hand may be passed into the rectum and the condition relieved thereby; but this method is rarely successful. If necessary a dose of oil may be given, but no drastic cathartics should be administered after cutting into the abdomen and straightening the bowel out. The animal should be kept quiet, and fed on soft food for a day or two.

CHAPTER XXI

Diseases of the Urinary System

NEPHRITIS (ACUTE)

Definition.—Inflammation of the kidneys. Urinary diseases are not nearly so common among the lower animals as among the members of the human family; especially is this the case as regards diseases more particularly referable to the kidneys, and nephritis is by no means the most common of kidney diseases. Like other diseases of the urinary system, it most frequently occurs in the chronic form, being rarely met with in the acute form; the whole substance of the kidney may be inflamed, but as a rule the inflammation confines itself to the lining membrane of the gland. One kidney may be inflamed to the exclusion of the other, or both may be inflamed simultaneously.

Causes.—Exposure to cold is a very common cause, especially if the animal be exposed immediately after being put to severe exertion, and when tired and covered with sweat, checking the perspiration suddenly being one of the most prolific of all causes of nephritis. Large and repeated doses of resin, potassium nitrate, and other diuretics, by stimulating and taxing the powers of the kidneys to the utmost, are very likely to induce an attack of nephritis, hence such medicines should never be administered needlessly, or in an indiscriminate manner. Certain kinds of food, as over-ripe grasses, food of an inferior quality, as mouldy hay and corn, certain plants, etc., may also have occasionally a powerful diuretic effect, and a tendency to produce an attack of nephritis; occasionally the absorption of cantharides may take place from a cantharidine vesicant, and give rise to inflammation of the kidneys. The same result may be brought about by the internal administration of cantharides, given under the false impression that sexual excitement may thus be brought about without resulting injury to the animal. The kidneys are exceedingly well protected, but it is still possible that nephritis may result from injuries such as would be likely to result from carrying heavy weights across country, jumping, falling, etc.

Symptoms.—The symptoms of nephritis are pretty well-marked; but some bowel diseases are often mistaken by casual observers, or incompetent men, for kidney disease. Azoturia is also frequently mistakenly confounded with nephritis. The pulse ranges from forty-five to fifty beats per minute, but increases in rapidity as the disease advances. More or less fever may be observed, as a rule the fever being well-marked, and the mouth and nostrils hotter than usual. The animal exhibits more or less pain and uneasiness, occasionally turning his head towards the seat of the pain, lies down, and sometimes rolls, but not often, nor so violently as in enteritis, colic, etc. When down and reclining upon his side, he frequently turns his head, and points with his nose towards the region of the kidneys, and now and then gives vent to a low moan or sigh. Frequent attempts are made to urinate, but little urine is passed, and that little is highly coloured, and sometimes mixed with blood. The bowels are usually constipated, as they are in nearly all diseases accompanied by fever. Patches of perspiration break out on the shoulders, flanks, etc. The flanks are sunken and the belly tucked up. In some cases the animal may walk with a straddling gait; but this action may be noticed in various conditions, and alone should not be regarded as a certain indication of nephritis. The pulse runs up rapidly, and the patient walks about as though he were under the influence of opiates, and gradually passes into a semi-comatose condition. Uræmic poisoning may set in, causing the animal to act as though intoxicated, and a strong uriniferous odour is given out in the perspiration. The condition is at this time a very serious one, and unless relief be quickly afforded the animal dies. There are other so-called tests by which it is claimed that the presence or absence of nephritis can be ascertained, such as pressing upon the back over the region of the kidneys; but such a test is worthless, for the reason that any irritable horse will flinch from any considerable amount of pressure upon this or any other, part of the body. Examination per rectum may assist in diagnosis by revealing heat in the region of the kidneys. Such a symptom though, at the very best, is a doubtful one. In a well-marked case of nephritis, casts of the uriniferous tubes may be discovered in the urine.

Treatment.—Every endeavour must be made to relieve the kidneys of work, and keep them quiet. To effect this object it becomes necessary to excite the other excretory organs to increased action. A good oleaginous purgative should be given in preference to aloes, as the latter may pass off by the kidneys and aggravate, instead of relieve, the disease. Aconite in the usual-sized doses may be administered at proper intervals, being highly useful to combat inflammation. Enemas of tepid water are very useful. The body should be well-clothed, and every effort made to induce perspiration. Hot cloths should be applied over the region of the loins, and covered with other cloths to retain the heat as long as possible. A newly-flayed sheep-skin applied over the region of the kidneys acts as an excellent counter-irritant, but as it cannot always be procured, some other form of counter-irritation must be employed. Mustard will answer the purpose very well. Cantharidine applications should never be used, as the cantharides may be absorbed and aggravate the trouble. In cases where the animal is plethoric, and at an early stage of the disease, a pretty good abstraction of blood may sometimes be attended with benefit; but, as a rule, phlebotomy is not to be recommended. Poultices of digitalis over the region of the kidneys are of the greatest possible service. Opium may be freely given to allay pain. Morphia is, however, preferable to the opium itself, inasmuch as it may be given subcutaneously, and in this way acts much sooner than when given by the mouth. The animal should be encouraged to take demulcent drinks, such as linseed tea, etc. A few doses of hyposulphite of soda may also be administered with benefit. The diet should be the best procurable, and the animal should be used carefully for some time after the subsidence of the attack.

NEPHRITIS (CHRONIC)

Chronic nephritis is of more frequent occurrence than acute nephritis, and a portion only of the gland may be inflamed; it is most common amongst old, hard-worked, and debilitated animals.

Causes.—Exposure to cold and wet weather, feeding on inferior food—as damaged corn, mouldy hay, etc.—the improper administration of diuretic medicines, etc.

Symptoms.—The symptoms of chronic nephritis are much milder than those of the disease in the acute form. The urine is scant in quantity, and usually high-coloured. No severe abdominal pain is manifested, as in the acute form; but as a rule the animal shows a slight stiffness in the region of the loins when first brought out. This symptom, however, soon disappears with exercise. The animal stretches himself in the stall, stretching out his hind-legs, and will stand sometimes for hours in that position. He gradually falls off in condition. Œdemic swellings now begin to appear in connection with the limbs. The horse becomes dull and languid in his appearance, as well as in his movements. The pulse is slightly elevated, and the appetite somewhat impaired and capricious.

Treatment.—It is not necessary to give powerful remedies. A mild oleaginous laxative should be given in preference to cathartics of a drastic character. The animal should be freely supplied with, and encouraged to take, mucilaginous drinks. Counter-irritation over the region of the loins is perhaps of greater benefit in this than in the acute form of nephritis. Antimonii Tart. is recommended by some practitioners on account of its supposed tendency to produce diaphoresis. It may be given in doses of ʒi.—ʒii. night and morning. A horse that has suffered once, and has recovered, should occasionally be given a mild diuretic, as potassium nitrate. The occasional administration of Sodæ Carb. in the usual quantities is also found very useful. If diuretics have no effect, it proves that the trouble is not due to functional inactivity of the glands. In such a case careful feeding on boiled oats, bran mashes, etc., should be tried. Rest should be allowed the animal, and during convalescence gentle exercise should be given, and the animal put on a course of tonics. The food should be of the very best, given in properly regulated quantities, and at regular intervals. Sometimes nephritis is septic in origin, owing to the entrance of pus-forming organisms. A fatal result is almost the invariable rule here.

HYPERTROPHY

An abnormal enlargement of one or both kidneys is a condition more frequently met with in the ox than any other animal. In some cases one kidney may be hypertrophied, and its fellow atrophied. The kidney may attain an enormous size, and the condition exist for a considerable length of time, without any sign of disease being presented. As a rule, the various diseases of the kidneys are very difficult to diagnose; but, when one or both kidneys become enlarged to a great extent, certain general symptoms are manifested, which may lead to an examination per rectum, when the condition, if well marked, may be readily discovered. A case is on record in which the kidney weighed fifty pounds; and Percivall mentions a case in which the kidney weighed upwards of one hundred and twelve pounds.

Treatment.—Treatment is not of much avail as a rule. Temporary benefit may accrue from the administration of tonics, and if the animal is in good condition the wisest plan is to call in the butcher.

Atrophy may be treated in the same way.

Melanosis.—Melanotic deposits in connection with the kidneys are by no means uncommon, especially among gray horses.

The *general symptoms* are those of kidney disease, the diagnosis being assisted in many cases by the presence of melanotic tumours on various parts of the body.

Treatment.—Very little can be done in the way of treatment. The owner should be warned that the duration of life of a horse with melanotic tumours on the body is very uncertain, and that sometimes death takes place very suddenly.

Floating Kidney.—One or both kidneys may be displaced. Professor Williams mentions a case of this kind, in which the kidney, under the supposition that it was a tumour, was removed from the side of a cat, the operation apparently causing very little or no inconvenience to the animal. It is a condition rarely met with, but one must not forget that the kidneys of the cat are always very mobile, and can readily be manipulated through the abdominal wall.

POLYURIA

This disease is also known by the names 'diabetes insipidus,' 'diuresis,' 'profuse staling,' etc. Polyuria is a dietetic disease, or, in other words, is primarily due to a deranged condition of the digestive system, which, causing an alteration in the condition of the blood, gives rise to an excessive secretion and discharge of urine, of a clear or colourless appearance, and of a low specific gravity.

Causes.—In a large majority of cases polyuria is due to faulty dieting, such as feeding the animal on damaged corn, mouldy hay or beans, or hay which has become mowburnt or overheated in the stack. Food of any kind, if of an inferior quality, may cause the disease. In many cases the continued use of impure or stagnant water may also give rise to polyuria, or it may occur as a result of some debilitating disease, such as strangles, influenza, etc.; in such cases it generally appears in the convalescent stage, usually about the tenth day from the beginning of the attack, and under such circumstances is regarded as by no means a bad symptom. It may also be produced by the too free, or continued, use of diuretics.

Symptoms.—The animal exhibits dulness of a well-marked character, languor characterizing every movement. The appetite is highly capricious, the patient one day eating heartily, and on the next day refusing all food. The pulse is weak, but not quickened; the thirst is insatiable, enormous quantities of water being consumed apparently with the greatest satisfaction. The coat stares, and the animal perspires freely on being put to the slightest exertion. Enormous quantities of urine are discharged. The animal becomes much weakened, rapidly falling off in flesh until frightfully emaciated; and, unless something in the way of relief be quickly done, death soon results.

Treatment.—The practitioner should first, if possible, discover the exciting cause, and remove it. The animal should have a change of food in all cases, and it is usually advisable to change the drinking-water also. Cooked food, as boiled oats, bran, etc., should be given. A recipe that was highly thought of by Professor Dick is the following: Iodine ʒi., potassium iodide ʒi., once daily. It is of the greatest service in long-continued cases of polyuria. It is, however, by no means a specific for the condition. In severe or urgent cases it may be given twice a day, in combination with any of the vegetable or mineral tonics. If its use does not appear to be attended with benefit, iodide of iron or general tonics may be tried, but the result is often very disappointing, and the cure only a temporary one.

ALBUMINURIA

By albuminuria is meant a condition of the urine characterized by the presence of large quantities of albumen. It may occur as a result of acute desquamative nephritis, but is more frequently caused by some irregularity of diet, faulty digestion, etc., giving rise to derangement of the nervous system. It is identical with 'Bright's disease' in the human family, and is very rare in animals.

Symptoms.—The patient exhibits more or less dulness, and gradually loses flesh; the coat is staring, dry, and dusty-looking, the patient having an unthrifty appearance generally. Œdematous swellings appear in connection with the limbs. Usually the swollen parts will pit upon being pressed, and in many cases the swelling of the limbs does not disappear with exercise. The favourite position of the horse while remaining quietly at rest in his stall is standing stretched out with his hind-legs pretty well back, and the fore-legs inclining forward. The urine is subject to frequent and sudden changes in appearance, at one time being almost colourless, at another time being very yellow in appearance, and at times is very thick. After rest the animal comes out of the stable with a stiff sort of motion, the stiffness being referable to the loins and hind extremities. The practitioner, having observed the symptoms enumerated above, will generally suspect the true nature of the case, and, to complete the diagnosis, should apply the test for albumen, which is as follows: 'Having secured a small quantity of the suspected urine, add to it a little nitric acid and apply heat, when coagulation of the albumen contained in the urine will at once take place.' The appetite of the animal is very capricious, and the pulse weak in character. The bowels are usually constipated.

Treatment.—A mild dose of cathartic medicine should be administered. Elaterium is used with considerable success in human practice, and is worthy of a trial in veterinary practice. In some cases benefit may attend the administration of a full-sized dose of cathartic medicine. The animal must be carefully protected from the vicissitudes of weather. Clothe the body, hand-rub and bandage the extremities. The food should be of the best quality, highly nutritious, and easily digestible. If convalescence can be established, give tonics, etc., but prognosis is very unfavourable.

RENAL CALCULI

Calculi are often found in the kidneys, and are usually composed of the salts of lime and magnesia. When one kidney only is affected the other sometimes becomes enlarged owing to the extra work thrown upon it. Calculi may be present without any other abnormal condition. They frequently exist for a long time without giving rise to any apparent inconvenience, or manifesting the slightest sign of their presence, the animal in such cases remaining in the best of condition. Sometimes they give rise to severe pain, and the other general symptoms of kidney trouble.

Treatment.—Very little can be done in the way of treatment except to give opiates to relieve pain. Demulcent drinks to relieve irritation existing in connection with the mucous membrane lining the kidneys and ureters, and some of the mineral acids, preferably hydrochloric acid, may be given for the purpose of breaking up or dissolving the calculi already formed, and preventing a further deposition of calcareous material. Occasionally it is possible that small calculi may pass down and out, either whole, or in partial or complete solution. In the dog and cat, when the diagnosis is definitely made, the calculus should be extracted by operation, or the whole kidney removed.

RETENTION OF URINE

In this condition the urine is properly secreted, in normal quantities, and passes to its proper receptacle, the bladder, but its escape from there is prevented, or at least retarded, by muscular contraction of the neck of the bladder, or by some foreign body. Retention is often seen in a case of colic. In other cases the escape of the urine from the bladder may be prevented by enlargement of the prostate gland, which, pressing upon the urethra, completely closes it. This is a common cause among very old animals. The condition is by no means an uncommon one among dogs. Retention of urine may also in some cases be caused by the presence of calculi in the bladder, paralysis of the bladder, or by urethral calculi.

Symptoms.—The animal shows slight uneasiness and pain, which increases as the amount of urine in the bladder becomes augmented in quantity by the constant flow of urine which takes place from the kidneys, and through the ureters. He makes violent and ineffectual attempts to micturate. In some cases he may succeed in voiding a very small quantity of urine, which usually comes away in a short but forcible jet, or dribbles away. The animal places itself in position to urinate, makes an effort, groans, and may lie down, turn his head towards the seat of trouble, and groan. An examination per rectum is all the test that is now required to make the practitioner certain that it is a case of retention, in which case the bladder may be felt distended with urine. In the dog and cat the distended bladder can readily be felt through the abdominal wall.

Treatment.—Having lubricated the arm and hand, they may be gently passed into the rectum until the bladder is reached, feeling full and distended beneath the hand. Gentle pressure should now be brought to bear upon it, and the contents may thus be forced, in many cases, to pass out. However, this method frequently fails to have the desired effect. In such a case warm water enemas, or an enema of a decoction of tobacco, may be tried, after which pressure may again be brought to bear upon the bladder. If failure be again experienced, the practitioner must pass the catheter. A small quantity of belladonna extract may be placed upon the end of the catheter, being useful to relax the spasm.

If this be impossible, the bladder may be punctured with a trocar and cannula.

SUPPRESSION OF URINE

By suppression is meant functional inactivity of the kidneys. The term 'ischuria' is often applied indiscriminately to this condition, and retention of the urine.

Symptoms.—The animal, in a well-marked case of suppression of urine, is duller than usual. The urine is passed only in small quantities, but is normal in appearance. Examination per rectum reveals the bladder empty, or nearly so.

Treatment.—Treatment merely consists of the administration of a good diuretic, such as nitrous ether, turpentine, or nitrate of potash, in the usual-sized doses. It is good practice also to administer a dose of digitalis. If, however, inflammatory action is suspected to exist in connection with the kidneys, diuretics should be withheld until the inflammation can be allayed.

CYSTITIS

Inflammation of the bladder may occur in all animals possessed of that organ. It is, however, not of very common occurrence.

Causes.—It sometimes follows difficult parturition, and may also be caused by exposure to cold and wet weather, the administration of irritant medicines, or diuretic medicines in excessive doses, especially if long continued. It sometimes results from the absorption of cantharides from a vesicant in which cantharides is used.

Symptoms.—The patient manifests considerable pain, the pulse is quickened, and febrile symptoms are exhibited in a form more or less marked; the mouth is hotter than usual, and the bowels are usually constipated. In some cases the gait of the patient may be somewhat straddling. The animal urinates frequently, this being the prominent symptom, a small quantity of urine being passed each time, and in the aggregate a considerable quantity is voided. An examination per rectum will reveal heat, and give rise to pain. The urine may, or may not, be altered in appearance. As a rule, the horse stamps, lies down, but rarely rolls in a violent manner, in many cases not rolling at all.

Treatment.—If the inflammation is very severe, and much fever is present, febrifuges and sedatives, as tincture of hyoscyamus or aconite, may be given with benefit. Tincture of cantharides in small doses will sometimes give good results. If the patient be a female, tepid water and opium may be injected into the bladder, enemas of tepid water being freely given per rectum. The patient should be warmly clothed, especially in the region of the loins, and kept perfectly quiet. In some cases a laxative, preferably of oil, may be given with very great benefit. The animal should be encouraged to take demulcent drinks, such as linseed tea.

MELANOTIC DEPOSITS IN THE BLADDER

Melanotic deposits are occasionally met with, particularly amongst gray horses. Tumours and fungoid growths of other kinds are also found in the bladder. In some cases they almost fill it, interfering with its functions to a considerable extent, and causing the organ to become distended, and the ureters very much enlarged. These conditions are very discouraging and troublesome to deal with, and usually terminate in the death of the animal. Melanosis, as above stated, is most frequently found in gray or light-coloured animals, and especially if of advanced age.

Symptoms.—There is always more or less difficulty in voiding the urine, which at first may be of a natural appearance; but after awhile blood may be voided with it, in consequence of rupture of a small bloodvessel. The urine may sometimes be somewhat dark in colour, owing to the presence of pigmentary matter. This is symptomatic of the existence of melanotic deposits within the bladder. The animal gradually falls off in condition. The bladder is found by an examination per rectum to be in a state of distention, and hanging over the brim of the pelvis, and on being emptied the tumour, etc., may usually be detected by manipulation of the viscus.

Treatment.—Very little can be done in the way of treatment. In case the trouble is caused by the presence of a fungoid growth, the animal should be carefully dieted, and the mineral acids administered. In cases where the growth does not give rise to much inconvenience, it had better be let alone. It is scarcely practicable to cut in and remove such bodies; still, such an operation might possibly be performed with success, and, in cases where it is the only alternative, should be tried; the after-treatment, of course, being that calculated to allay inflammatory action. The diet should be highly nutritious, and properly regulated as to quantity, etc.

INVERSION OF THE BLADDER

Inversion of the bladder is of most frequent occurrence amongst mares and cows, and usually follows difficult parturition.

Symptoms.—A small and reddened tumour-like substance is noticed protruding from the vulva, and is often mistaken for the mucous membrane of the vagina, a mistake which may easily be dissipated by a manual exploration of the parts. The urine escapes, and, dribbling down over the thighs, excoriates the parts, and causes considerable irritation.

Treatment.—Bathe the displaced organ with warm antiseptic solution and opium. Having cleansed it nicely, and allayed any irritation that may exist, the bladder should be gently returned to its prop[illegible]e as soon as possible. The vagina may be injected with tepid or cold water, according to judgment. The hind-quarters should be elevated and anodyne injections given, as well as opiates by the mouth, to prevent straining on the part of the animal. In cases where the condition has been present for some time and neglected, the bladder may become gangrenous. In such a case it is the better plan to destroy the animal at once.

CYSTIC CALCULI

Cystic calculi may be caused by the use of hard water (or water containing lime) for drinking purposes, especially in cases where an animal is worked steadily for hours at a time, and not given an opportunity to urinate. In other cases, a foreign substance of microscopic proportions may be present in the bladder, and act as a nucleus, around which the calcareous material becomes deposited.

Symptoms.—In some cases a single calculus may be present, and gradually increase in size until it becomes very large. In other cases, calculi may be present in large numbers, giving rise to well-marked symptoms: the urine being voided with difficulty, and changed in colour, becoming unnaturally white or milky in appearance. The first that is voided may be clear, but as the bladder empties itself the urine takes on the above-mentioned milky appearance, or may be dark in colour. There is always more or less irritation of the bladder, there may occasionally be retention of urine, and the penis often hangs pendulous. While urinating, and a full round stream escaping, the flow may be suddenly checked, in consequence of the calculus entering the neck of the bladder. The animal, however, retains his position, makes further efforts to urinate, and, in some cases, succeeds after awhile. In other cases he fails, or the remainder of the urine may dribble away a few drops at a time, and run down upon and excoriate the inside of the thighs. In many cases the urine may be tinged with blood, or the passage of a small quantity of blood may immediately succeed the act of micturition. Sometimes the animal exhibits pretty severe abdominal pain. An examination per rectum is all that is now required to complete the diagnosis. A hard movable body, or a number of them, may be felt in the bladder, and the practitioner may rest assured that the case is one of cystic or vesical calculi. In some cases, instead of any hard substances being discovered, there will be found a soft, pasty mass of sabulous material. The animal may be in a good or bad condition.

Treatment.—If the formation of the calculi is due to the character of the water the animal has been drinking, it should be changed to rain-water preferably to any other, and salt added to it, in addition to which the animal should be allowed all the salt he will voluntarily consume; the mineral acids may also be given, and in many cases the calculi, if small, may be dissolved and pass out with the urine. If the calculi are large, however, acids will be of little service. In such a case it becomes necessary to perform lithotrity or lithotomy. Both operations are now frequently done with success if antiseptic details are carried out. The operation of lithotomy, though, may be performed with success as follows: The animal, having had a few days' preparation, is to be cast and secured, after which a catheter should be passed into the bladder, and an incision made in the median line, right through the perinæum, and down upon the catheter; the incision may be enlarged, and the catheter withdrawn, when the forceps, nicely oiled, should be inserted and carefully passed along the canal, the other hand being placed in the rectum for the purpose of guiding the calculus into the forceps. The operation is one rather difficult to perform, requiring on the part of the surgeon great care and patience, as well as a good knowledge of the anatomy of the parts. The principal danger is from infiltration of urine into the tissues setting up irritation, and perhaps causing death. Calculi may be removed with greater ease from females, especially amongst cattle.

URETHRAL CALCULI

Urethral calculi differ from those previously mentioned only in situation. Calculi existing in the kidneys are known as 'renal calculi,' and on reaching the bladder become known as 'cystic' or 'vesical calculi,' the same calculi on reaching the urethra being termed 'urethral calculi,' the general term 'urinary calculi' being employed to designate calculi in connection with any portion of the urinary system. In cattle troubled with urinary calculi, calcareous deposits may usually be found on the hair around the prepuce, and these deposits can be detected in the urine of both horses and cattle affected in this manner. Sometimes the calculus is found to be encysted in the bladder, but although encysted may be movable. The presence of calculi may set up irritation in the mucous membrane of the urethra of the ox, and stricture result, stricture being in nearly every case caused by calcareous deposits. In such a case the catheter cannot be passed, the only remedy being to cut into the urethra and divide the stricture; this operation in fat cattle will be found rather difficult, but may be easily performed on a lean animal. The animal should be allowed only soft water to drink, and hydrochloric acid should be administered in large doses; the bladder may also be injected with tepid water and hydrochloric acid. The removal of calculi from cows and mares is an operation performed with comparative ease as follows: the meatus urinarius and urethra being dilated, the forceps, well-oiled, may be passed in, and a very large deposit removed without having recourse to the knife. Sabulous deposits are more common in mares, and may be removed by injections into the bladder, or by inserting a spoon and scooping it out.

Symptoms of Urethral Calculi.—The animal has great difficulty in urinating, and performs the act with great straining and groaning, and sometimes there is a very perceptible bulging out of the perinæum.

Treatment.—The treatment consists of injecting the urethra with warm water, and endeavouring to displace the calculus by manipulation; if this fails the offending agent must be cut down upon and removed, the wound closed and treated as an ordinary wound.

Fossa Navicularis.—An accumulation of sebaceous or sabulous matter frequently takes place in the fossa navicularis, and in many cases causes serious obstruction to the flow of urine; the penis and sheath are in such cases found very dirty. This condition is most common amongst geldings, as they do not protrude the penis to the same extent as stellions do. The treatment consists of removing the sabulous matter, and washing the penis and sheath thoroughly with warm water, after which a little lard may be applied to the parts; geldings especially should be frequently examined, and these parts cleansed. It is usually noticed that more or less swelling of the sheath follows washing, but this should excite no fear, as it will disappear in a short time.

Hæmaturia, or Bloody Urine.—Frequently hæmaturia is symptomatic of calculi, which may exist in any part of the urinary system; a severe strain across the loins, causing rupture of some of the small bloodvessels, may also give rise to hæmaturia. The practitioner should endeavour to ascertain the history of the case, and, if possible, find out the exact cause of the bloody discharge, and if it is due to cystic calculi, treat in the usual way; if the hæmorrhage is from the kidneys, plumbi acetas grs. xx. may be given in combination with tr. ferri chlorid. Small doses of opium may also be administered to allay pain, followed by the mineral acids. The animal should be carefully dieted, etc.

PARALYSIS OF THE BLADDER

Paralysis of the bladder gives rise to symptoms which in many cases may cause the true character of the disease to be overlooked. The condition may be caused by the urine not being passed freely, in consequence of which a certain amount of fluid is always retained in the bladder, finally causing paralysis and enlargement of that organ.

Symptoms.—The animal experiences considerable difficulty in voiding the urine, which is passed in small quantities, is usually of a yellow colour, and is not ejected in as forcible a manner as though flowing from a healthy bladder. The animal apparently finishes urinating, and returns to his former position, instead of remaining stretched out; when the practitioner, on making an examination per rectum, will be astonished to find the bladder yet containing an enormous quantity of urine. Gentle pressure may force it out, but it is better to use the catheter to draw it off; after which the bladder should be injected with tepid water, gradually changing to the use of cold water, and nerve tonics, laxative food, etc., should be given. Paralysis is sometimes associated with urinary deposits; it is a troublesome condition and often incurable, especially if of long standing.

Enuresis, or Incontinence of Urine. — This condition is the opposite of retention. It may be caused by an irritable condition of the bladder, loss of nervous influence, etc., and is characterized by the involuntary and almost continual escape of urine.

Treatment.—Benefit will result from injecting the bladder with warm water, changing gradually to cold; nerve and diffusible stimulants will be found useful, and a thorough course of constitutional treatment may, in some cases, be necessary.

CHAPTER XXII

Diseases of the Male Organs of Generation

ORCHITIS

Definition.—Inflammation of the testicles. Orchitis is a very serious condition, but one not very frequently me with; it is caused by direct injury, as a rule, such as blows, kicks, covering mares in an improper manner, exposure to cold, absorption of blood poison in some cases, and it may occasionally be the result of indirect injury, as strains caused by running, jumping, etc.

Symptoms.—The animal suffers great pain, and the parts become greatly swollen; pyrexia is a prominent symptom, the pulse being quick, full, and bounding. As a rule the animal retains the standing posture; occasionally a case may be met with in which the animal lies down, and in some cases attempts to roll. When standing, the patient may elevate one of his hind feet from the ground, and during progression he walks with difficulty, expressing his pain by frequent groans; he walks with the hind legs widely separated, having a straddling action.

Treatment.—Fomentations of hot water frequently applied, and for several hours at a time, will be productive of the greatest benefit, soothing and allaying irritation in a wonderful degree. A soft sponge should be used to apply the water; internally, a full dose of either aloes or Epsom salts may be given. If the animal is in a plethoric condition, venesection or the administration of aconite may be attended with benefit. The testicles should be supported by means of a suspensory bandage padded with cotton, tow, or some similar soft material, which should be constantly kept in a moist state by pouring on warm water. Sedatives such as opium or belladonna liniment, lead, and opium, or other refrigerant lotions, applied locally, are valuable to allay pain. Warm water clysters are very soothing. After the inflammation is allayed there is usually a considerable amount of exudation, which may be got rid of by a course of potassiu[illegible]e, and in some cases it may be necessary to stim[illegible] the testicles locally with iodine ointment.

In chronic orchitis the animal should be castrated.

Hydrocele, or Dropsy of the Scrotum.—Hydrocele occurs as a result of orchitis, and may follow some other conditions. It is a condition not very commonly met with in horses, and, as a rule, not very serious.

Treatment.—If the scrotum contains much serum, it may be drawn off by means of a small trocar and cannula, or preferably by an aspirator. Iodine may be injected into the scrotum, to prevent further formation of fluid. If the animal is not wanted as a stallion castration should be performed. The dropsical fluid often contains worms (*Strongylus tetracanthus*).

PARAPHYMOSIS

By paraphymosis is understood protrusion of the penis, with inability on the part of the animal to retract it. It is caused by injury, either directly or indirectly received. Stallions suffer more frequently than geldings, in consequence of the penis being handled roughly, or otherwise injured, while the animal is covering a mare. Another cause is too frequent coition. Exposure to cold also produces it, in both stallions and geldings, and occasionally the condition may occur in connection with ulcerating growths.

Symptoms.—The penis may be easily seen protruding from the sheath, and blood gravitating into it causes it to become very much swollen.

Treatment.—If possible, the practitioner should get the history of the case, and if it is a case of paraphymosis due to force, the prognosis should be favourable. If it is caused by too frequent coition, the prognosis should be unfavourable, and decidedly so. However, most cases are worth a trial if the condition has not existed too long. The penis should be nicely and thoroughly cleansed, after which it should be freely scarified, and bathed with warm water for an hour or so. It should be supported by means of a suspensory bandage. Manipulation will also sometimes reduce it, so that it can be partially returned within the sheath. The treatment should be energetically persevered in, or gangrene may result. Constitutional treatment should also be adopted. A laxative should be given; febrifuges, diuretics, etc., also being of service. The above treatment is more particularly adapted for paraphymosis resulting from injuries, cold, etc. The treatment of paraphymosis arising from too frequent coition is, however, nearly the same, with the additional administration of nerve stimulants. In either form of the condition, after the inflammation is allayed, astringent lotions, cold water, etc., will be found useful. Tonics should also be given, and a nutritious and liberal diet allowed. In some cases it may be months before a cure can be effected, a notable case being that of 'Hard Fortune,' a very good horse, that suffered from paraphymosis for eighteen months, but finally made a good recovery, and got many foals, serving from one hundred to one hundred and twenty mares each year for many years afterward. If the penis becomes gangrenous it must be removed, the operation being performed under chloroform.

PHYMOSIS

This is the opposite condition to paraphymosis, and consists of inability to protrude the penis from the sheath, where it is retained in consequence of the orifice becoming abnormally small or contracted. This condition is oftenest met with amongst geldings, and may be due to the animal getting into the habit of urinating without properly protruding the penis. The orifice through which it should pass gradually becomes smaller in size until it is too small to allow the penis to be protruded, or the condition may be caused by swelling supervening upon castration, or an injury of some kind. And some horses, having very small sheaths, are more or less predisposed to phymosis. Ulceration may occur in connection with it. The presence of warts may also give rise to the condition.

Treatment.—If phymosis occurs as a result of castration, one or two punctures should be made in the sheath, to allow the serum contained therein to escape, after which the parts should be fomented. If the condition occurs in consequence of the presence of warts, the animal should be cast and secured, the penis withdrawn from the sheath, the warts removed, and antiseptic lotions afterwards applied. If due to constriction of the prepuce, the latter may be incised, but as a rule the constriction re-forms tighter than on the previous occasion. Scarification may in many cases be all that is necessary.

Tumours on the Penis.—In connection with the penis—usually in connection with the glans penis—tumours of various kinds may occur, some of them malignant in character. These are most frequently met with amongst geldings, and are usually carcinomas or papillomas. In many cases an offensive discharge takes place.

Treatment.—Such growths have to be removed with the knife or ecraseur. The wound thus made should be kept thoroughly clean and dressed with antiseptic or astringent and deodorizing lotions. For this purpose carbolized oil forms a nice lubricant to the sheath, and the various preparations of creolin, such as Jeyes' Fluid, etc., are excellent deodorizers.

Amputation of the Penis.—This seems to be a very formidable operation, but is necessary sometimes. Cast the patient, draw out the penis, and remove as much of the organ as may be necessary, either with the knife, or the ecraseur. If the former instrument be used, the operator must ligate the bloodvessels to prevent undue hæmorrhage; he should also pass the catheter before operating, and try to keep it there a few days, to prevent closing of the urethra by cicatrization. The parts must be kept clean and dressed with antiseptic lotions.

Excoriation of Penis.—Excoriation of the penis may be caused by direct injury, such as may be sustained by a large horse whilst covering a small mare, especially a mare that has never been served before. It may also be caused by putting a horse to a mare too soon after foaling—the mare having an irritant or putrid discharge from the vagina, which irritates and excoriates the penis. The condition may sometimes also be due to some contagious disease (*Maladie du Coit*).

Treatment —The animal should not be allowed to serve any mares, even for some months after apparent recovery has taken place. Strict attention to cleanliness of the parts should also be observed—warm water being freely used and antiseptic lotions applied. Of these, the best are Chinosol (1 in 500 to 1 in 1,000), Hydrarg. Perchlor. (1 in 1,000), Creolin or Lysol (about 1 in 100). The diet should be reduced, and a laxative given in cases where it is deemed necessary. If the penis is retained within the sheath, and it is desired to have it out, the animal should be taken near to a mare, when he will protrude the organ of his own accord. This method being much better than the operator pulling it out.

URETHRITIS

Inflammation of the urethra may be caused by the presence of urethral calculi, injury to the penis by handling roughly, etc.

Symptoms.—The animal shows pain when urinating, and does not retract the penis for some time after the act is completed. The urethra, on examination, is found to be red and inflamed.

Treatment.—A full dose of cathartic medicine should be administered, to be followed by urinary sedatives, such as hyoscyamus. The urethra should also be injected once or twice daily with a solution of zinc sulphate (grs. ii.-iv. to ℥i.). The diet should be liberal, especially after the acute symptoms have subsided ; and in cases where there appears to be any tendency to the continuation of the disease in a chronic form, or where there is any discharge discovered issuing from the urethra, a course of potassæ iodid. will be found of the greatest service. When a calculus is present it must be removed by operation (urethrotomy).

ULCERATION OF THE URETHRA

Ulceration of the urethra may be caused by injuries of various kinds, such as kicks, lacerations from sticks, getting over a partition between two stalls, etc. If allowed to run its course a fistula may be the result. Ulceration of the urethra usually occurs in the region of the perinæum. The urine escapes if a fistula becomes established, and the condition becomes exceedingly troublesome and difficult to cure.

Treatment.—Absolute cleanliness is imperative, the wound being dressed, if possible, several times daily unless it becomes evident that the healing process is retarded thereby. The edges of the opening should be scarified and brought together by means of sutures. Astringent and soothing applications should now be used, but if the wound be indolent, and slow to heal, it should be stimulated by touching with argenti nitras, either solid or in solution.

Variola.—This disease may occur in connection with the penis, may be transmitted during coition from one animal to another, and may give rise to symptoms similar to venereal disease. Any animal suffering from any irritation in connection with the generative system should not be allowed to participate in the act of copulation for quite a length of time, or until cured, as it may be a sexual disease of a contagious character. And even though it is not a disease of a contagious character, coition, so long as continued, is likely to keep up the irritation and retard recovery.

Maladie du Coit.—Under this name is described a disease occurring both in the malignant and non-malignant forms. The disease results from the act of copulation, and has been likened to the syphilis of man. For a good description, etc., of the disease, see Williams's 'Medicine,' in which the subject is fully treated.

CHAPTER XXIII

Glanders and Farcy

GLANDERS

GLANDERS may be defined to be a well-marked malignant disease of a contagious character, its immediate cause being a specific organism—the *Bacillus mallei*. Its ravages are particularly shown by the presence in old-standing cases of sores or ulcers in connection with the Schneiderian membrane. The respiratory system is always more or less involved, and there are usually well-marked lesions in connection with the lung tissue and the whole of the lymphatic system. Farcy is essentially the same disease, but manifested in a different manner; it is really the cutaneous manifestation of glanders, the two varieties of the disease being described under the generic term of 'equina.' It is one of the most serious and loathsome, as well as invariably fatal, diseases to which horse-flesh is heir. It is in all its forms communicable to sheep, goats, all animals of the canine and feline families; to mice, rabbits, etc., and to man, in whom the disease seems to increase in intensity, and rage with greater malignancy than amongst the lower animals. It is, however, most commonly met with in members of the equine family.

History.—The disease is undoubtedly one of very great antiquity, having been mentioned by Hippocrates, who lived about two thousand years ago, and the disease probably existed for thousands of years before that time. Vegetius, Aristotle, and many other early writers also described this disease, which has probably received more attention, and justly so, than all other equine ailments combined. Almost every medicine mentioned in the pharmacopœia has been administered, singly and in combination, with the hope of finding a remedy for the disease, but without the slightest success, the disease, so far as is known to the profession of to-day, being incurable. It has been demonstrated, however, that some cases may recover without treatment. The name 'glanders' has been applied to the disease from the fact that the malady invariably shows itself in connection with the glandular system. Although no one has ever been able to discover a cure for this dangerous disorder, the profession has done a great deal of good by pointing out and explaining its dangerous character, and recommending measures by which it may be kept from spreading, and its occurrence in many cases prevented. Hence the disease is not nearly so common as it was a century ago, and is growing less and less frequent, and may in course of time become extinct—an end which could be hastened by active legislation in regard to the matter. Glanders was unknown in Mexico until the occurrence of the war with the United States in the year 1847, it being carried there by the horses of the American army. It is said that a case of glanders has never been discovered in Australia; it is of very rare occurrence in India, but has been noticed in the latter country amongst horses brought from Australia, the disease being in all probability contracted by those horses whilst on board ship, and not while in Australia.

Causes.—It used to be claimed by eminent authorities that glanders could appear spontaneously. This, however, is now known to be a fallacy. There is only one cause, and that is the presence of the organism of glanders, the *Bacillus mallei*. The most ardent supporters of the theory of spontaneity have never been able to clearly demonstrate a case in which glanders originated spontaneously. It is usually met with in the most severe form in large cities, where many horses stand crowded together in dark underground and badly-ventilated stables, in coal-pits, and similar places where the animals are compelled to breathe foul air and noxious vapours for several hours out of the twenty-four. Impure water, a damaged or insufficient supply of food, hard work, etc., are all predisposing causes, and render the animal more susceptible to the contagious influence. It is more common, and of greater severity, during the progress of war than at any other time, owing to the manner in which the horses are kept, being exposed to all kinds of weather and often half starved. An animal is also more likely to contract glanders when greatly debilitated from previous disease, such as influenza, diabetes, etc., some claiming that the latter disease frequently terminates in glanders; but no proof has ever been adduced in support of the assertion. There is no question but that diabetes is a symptom suspicious of glanders in stables where glanders is known to be constantly occurring. When an animal, being at the time weak and debilitated, is exposed to contagious influences it is less able to resist the action of the poison, while the same animal, if in robust health, might be exposed a dozen times without contracting the disease. In Great Britain glanders is especially prevalent in London, Liverpool, and Glasgow, and certain stables in these cities are veritable hot-beds of the disease. In many of the cab stables, in particular, the horses are crowded together without adequate ventilation or drainage, and, what is worse, are all allowed to drink from a common trough and eat from a long, continuous wooden manger. It is not surprising that glanders spreads under such conditions, as the food or water which is contaminated by the nasal discharge of an infected horse is readily obtained by its neighbour.

Contagion.—Glanders should always be considered as a contagious disease, although cases are often met with in which healthy animals work side by side with affected animals, day after day, for a year or more, without contracting the disease. The virus of glanders may be taken into the stomach with food or water, but the nasal discharge is the most virulent and potent in the propagation of the disease. A horse suffering from glanders in the acute form spreads the disorder with much greater rapidity than one suffering from the disease in the chronic form.

Period of Incubation.—The period of incubation in the acute form of glanders is short, the disease usually appearing in from three to seven days from the time of inoculation, while the chronic form may appear at any time, from seven or eight days up to even a year from the time the animal was exposed to the contagious influence. Glanders exists to a considerable extent in those parts of the country where itinerant horse-traders or gipsies operate.

Symptoms.—Chronic glanders is the most common form of glanders, and is oftenest seen in old and debilitated animals. It is one of the most insidious of all diseases, and an animal may suffer for months without showing any well-marked symptoms, and while in this condition may communicate the disease to as many horses as come in contact with him. The animal may suffer for two or three years, remain in good condition, and work during that time. The disease is often ushered in with a chill, which may or may not be well marked, in many cases being so slight as to escape observation; at this time slight dulness may also be noticed, the animal heat rises to 101° F., or in some cases the thermometer may show the temperature to be as high as 103° F., but if it passes the latter point the case becomes one of acute glanders. In a short time there may usually be observed a comparatively slight nasal discharge. The discharge usually issues from but one nostril, although it may issue from both in some cases; when it is from one nostril only, it is almost invariably the left nostril in America and in Britain, although French observers have noted that the right nostril was most commonly affected first. There seems no constant rule about this. The discharge is at first of a sort of greenish appearance, but may change to yellow or white; it is very viscid, sticking tenaciously to anything it comes in contact with; it adheres closely around the nostrils, in a manner very similar to the discharge of nasal gleet, but, if anything, is more viscid and adheres more closely. It contains albumen in large quantities, and on being thrown into water readily sinks. This is a test upon which a great deal of reliance used to be placed; still, it should not be accepted as conclusive evidence that the case is one of glanders. No oil globules can be found in the discharge from the nostrils. As a rule there is heard a slight cough about this time; the coat becomes dry and staring, and feels harsh under the fingers; the appetite becomes impaired to a slight extent, and the animal gradually falls away in flesh. The nasal discharge may in some cases have a watery appearance at first; soon there may be observed, if the case be closely watched, the formation of little elevations on the Schneiderian membrane, which in course of time become fully developed, burst, and form ragged-edged and pretty deep ulcers, which sometimes heal—such cases, however, being exceedingly rare. When an ulcer of this description does heal, it leaves a white cicatrix, very peculiar in appearance, and looking as though incomplete. The Schneiderian membrane around the ulcerated patches is of a pale or leaden colour. If the disease lasts a sufficient length of time, the Schneiderian membrane becomes a mass of ulceration; the ulcers run together, or communicate, and are then described as 'confluent'; the septum itself may in many cases be perforated, and the pulse is always found to be weakened, but in many cases is not quickened, or, if quickened, very slightly so. As the disease advances there may frequently be observed a slight irritation of the eye on the same side as the nostril that is discharging, and a slight purulent discharge may issue from this organ; this is frequently one of the first symptoms to put in an appearance. On making an examination, the submaxillary lymphatic glands are found to be hard and indurated, and pretty firmly attached to the bone. In some cases the ulcers may exist high up out of sight, and no sign of ulceration be observed in connection with the visible portions of the pituitary membrane. The discharge is not offensive in odour unless the ulcers extend to and affect the turbinated bones, in which case the discharge becomes highly offensive; the ulcers may even extend to and involve the pharynx, larynx, and trachea. If the practitioner meets with a case he is doubtful of, he should explain to the owner of the animal his suspicions that the case is one of glanders, and the animal should at once be isolated in such a manner as to have no communication whatever, either directly or indirectly, with any other animal. A dose of mallein should then be given. Mallein is a product which is obtained by certain bacteriological processes from the *Bacillus mallei*, and is an almost infallible test for the presence of glanders in the system. It is a clear or straw-coloured fluid, and is inoculated subcutaneously in a suspected animal, about 18 or 20 minims being an average dose. It is usually placed under the skin of the neck, the syringe and the seat of inoculation being disinfected first. If the horse is glandered the temperature (which is taken every three hours from the sixth to the eighteenth hour) will show a steady rise; there may also be great constitutional disturbance, and at the seat of inoculation there will appear a tense and very painful swelling, which grows gradually larger until the third or fourth day, after which it will slowly disappear. The mallein test is practically an infallible one, and many practitioners dispense altogether with the taking of the temperature, relying entirely upon the local reaction. Mallein was discovered by Kalning and Hellmann, and it is largely to the original work of McFadyean and Hunting that we, in English-speaking countries, owe a great deal of our knowledge upon glanders and the mallein test. With mallein, the slightest infection of glanders, without any external lesion whatever, can be detected with certainty. The mallein test is as reliable and infallible as any disease test can ever hope to be, and if no glanders exists the horse's system is not in the slightest degree interfered with or upset. As previously stated, there are cases in which the ulcerated patches are not visible, but the leg swells.

Post-mortem.—A post-mortem examination reveals the presence of small shiny nodules in the lungs, and sometimes also in connection with the mesenteric glands. Ulceration of the mucous membranes lining the nasal cavities and sinuses is met with in bad cases. On proceeding further backward there may be seen little elevations which have not yet reached the ulcerative stage; the septum nasi may be almost obliterated and the turbinated bones may be partially destroyed. Sometimes ulcers are seen in the lining membrane of the larynx and trachea. The respiratory tract may show evidence of having suffered from a slight inflammation. The greatest care should be exercised in making an examination, or the operator may inoculate himself. One must not forget that there is a small strongyle which produces nodular growths in the lungs of horses. This disease is not common in England and can be distinguished from glanders only by microscopical or bacteriological tests.

ACUTE GLANDERS

The period of incubation of glanders in the acute form, as previously stated, is usually from three to seven days, but occasionally the disease may not manifest itself until fourteen or fifteen days after exposure.

Symptoms.—As a rule glanders occurring in the acute form may be readily recognised by anyone acquainted with the disease; but occasionally on the first examination a case may be mistakenly diagnosed as purpura hæmorrhagica. The attack is ushered in with rigors, and well-marked anorexia is observed at an early stage; the pulse becomes quickened, the coat staring, a cough is usually present, and frequently there are presented symptoms of pneumonia, indicating that the lungs are affected; there is often a good deal of constitutional disturbance. The temperature becomes elevated, in some cases reaching 107° F.; the breathing becomes difficult, which is, in most cases, due to the lung complication mentioned above, and the head may become slightly swollen. There is a nasal discharge, which is usually more abundant than the discharge of chronic glanders, and is horribly fœtid in most cases, as is the breath of the animal. The discharge may also be frequently tinged with blood, in consequence of the opening of a small bloodvessel by ulceration. Ulcers may be seen on the pituitary membrane. These ulcers quickly become confluent, and the membrane a mass of ulceration. The superficial lymphatics of the body and limbs may swell and burst. The animal now presents a most loathsome appearance and soon dies. In such cases the virus is very potent indeed. There is great danger in being about glandered horses, especially if the person so doing has sores or open wounds on his hands into which the virus may obtain entrance. If it gets into the nose it is likelier to produce the disease quicker than if entrance into the system was effected in some other way. The brushes, rubbers, and other grooming utensils which have been used for a glandered or farcied horse are a source of danger and should be destroyed.

Treatment.—Glanders, so far as is known to the profession, is incurable, whether occurring in the chronic or acute form, and the animal should be killed. It has been thought that by serum or mallein inoculation it might be possible to arrest the spread of this terrible disease, and control it to a greater or less extent; but the only proper way to do so is to stamp the disease out, which could be done by proper laws rigidly enforced. In England, when glanders is known to exist, the case is reported to the police authorities, who call in the Local Government Veterinary Inspector. The horse is killed, and the carcase buried deeply in quicklime in country places, or, in London or large towns, removed in a specially constructed cart to the knackers, where it is completely disintegrated and destroyed by steam at high pressure. The clothing, harness, bridles, and everything the animal wore while living, and the bedding, litter, straw, etc., may be easily and economically disposed of by placing them in a heap and destroying by fire, the loss thus incurred being trivial in comparison with the loss of horses that may result by keeping those articles. The stable, manger, stall, etc., should be thoroughly cleansed with boiling water containing disinfectant, and in cab stables it is usual to use limewash freely afterwards.

FARCY

As previously stated, farcy is identical in character with glanders, being merely the cutaneous manifestation of the same disease. It is sometimes called 'bud-farcy,' 'button-farcy,' etc., and may occur in the acute and chronic forms. When it occurs in the acute form, the symptoms of glanders are quickly manifested, and the animal dies. There are several stages of farcy. It occurs more especially in connection with the superficial absorbents, the lymphatic glands. Generally, the disease occurs in the chronic form, as follows :

Symptoms.—As a rule, the first symptom to attract attention is a swelling of the limbs, very much like that accompanying an ordinary attack of lymphangitis. The swelling is also very painful. After a time little elevations rise on the line of the lymphatic vessels, and they become corded, giving rise to what are called 'farcy cords.' These elevations in due course of time burst, and become ulcers, from which an unhealthy-looking discharge takes place. This discharge contains the specific poison, the glanders bacilli, by means of which, when introduced into the system of a healthy animal, an attack of glanders may be produced. The ulcers show no tendency to heal properly. Occasionally they may heal, but only to be succeeded by a new outbreak in the same place, or in some other part of the body, which circumstance should be regarded with suspicion. The head may begin to swell after a time, and a discharge take place from one or both nostrils. Glanders in such a case may be considered as established. In some cases there may be only one or two little elevations, or abscesses of ordinary appearance, which on being found to fluctuate are opened, and heal pretty well. In a week or so another one breaks out in the same place, or in another part of the body, or a large number may appear at the next eruption; this may be continued for a long time. Such a case should be regarded with suspicion and watched closely, as well as tested in the usual way. In other cases a hind leg may swell to a slight extent and quickly subside again, but the lymphatic glands remain corded. In still other cases the lymphatic glands may become corded without the leg ever having been swollen in the slightest degree. Pressure upon the corded lymphatics causes a manifestation of pain. The lymphatics of the neck, sides, etc., may become corded. In some cases the farcy buds become indurated, the leg permanently enlarged, and the animal remains in this condition, appearing to get no worse. He also has the power at this time of communicating the disease to other animals.

Acute Farcy.—The acute form of farcy is the form of the disease least frequently met with, and is manifested as follows:

Symptoms.—The disease develops itself quickly, and in a manner similar to that of lymphangitis. The animal has rigors, followed by dulness, and on examination pyrexia and anorexia are found, both well marked. The pulse becomes quickened, the coat staring, dry, and dusty in appearance. In a very short time the farcy buds appear, develop, burst, and become confluent. Symptoms of glanders in the ordinary acute form may now appear, and death occurs in from ten to fifteen days.

Treatment.—As the disease does not admit of cure, treatment should not be attempted, but the animal should be destroyed, and the other measures employed in dealing with a case of acute glanders should also be adopted in dealing with farcy occurring in either form. Cures of farcy and glanders are on record, but such records are rare, and the supposed cases of farcy and glanders may have been some other disease, or, if genuine, the so-called cures were nothing more than cures in appearance. Chronic farcy will develop into acute farcy or glanders in every instance. Most cases of chronic farcy can be improved by the administration of tonics, high feeding, touching the ulcers with caustic, etc. But the case can be only temporarily relieved. The animal must be destroyed as soon as the practitioner becomes satisfied that he has a case of farcy or glanders to deal with, as, although the disease may, by a course of medicine, etc., be checked, the virus still remains in the system of the animal, and sooner or later is certain to break out again. Such an animal endangers the lives of other animals as well as the life of his attendant, and for that reason, if for no other, should be destroyed. The practitioner should be very careful in examining affected animals, or he may contract the disease. A dose of mallein will quickly enable a correct diagnosis to be made.

CHAPTER XXIV

Variola

VARIOLA EQUINA

All the domestic animals appear to be subject to variola, or pox, in some form or other. It is similar to small-pox in the human family, but is comparatively simple. It is an acute febrile disease, producing eruptions or pustules, and, like all febrile diseases, runs a certain course. It belongs to the zymotic class of diseases, and is propagated solely by contagion, so far as our present state of knowledge goes. After exposure and contagion there is the usual period of incubation, followed by fever, and, in due course of time, an eruption, which appears in the form of small reddish nodules, each in size somewhat smaller than a pin's head, and surrounded by a red areola. These nodules gradually change in character and become vesicles, containing a clear lymph, which in due course of time loses its transparency and becomes purulent. The pustules burst and discharge their contents, forming a dry crust or scales, which wear off in a few days. There is a primary fever and a secondary fever. The fever in a majority of cases is most severe just before the eruption. The disease is usually of a benign character.

Symptoms.—The symptoms of variola, as it occurs in the horse, are dulness, more or less fever—in many cases being so slight as to almost escape notice; the pulse becomes somewhat quickened and weaker than usual; there is increased thirst, and the appetite becomes impaired. Soon red patches appear upon the skin, and these patches are depressed in the centre. The nodules appear most thickly about the mouth, nose, Schneiderian membrane,

heels, etc., and gradually taking on the character of vesicles
become filled with transparent lymph. The pustular stag
now follows, the vesicles becoming pustules which brea
and discharge, in some cases, several times in successio
These pustules may become confluent, and when runnin
together on the pituitary membrane have caused the diseas
to be mistaken for glanders. When the mouth is muc
affected the animal masticates with difficulty. Variola run
its course in from eight to fifteen days, and is anything bu
a serious disease if treated in a rational manner. The viru
is in the fixed form, and the disease may be communicate
to man and from one animal to another by contact, and b
the virus obtaining entrance into a wound or sore. Th
period of incubation is from six to twelve days.

Treatment.—The animal must be kept warm and care
fully guarded from sudden chills, draughts of cold air, etc
The danger lies in checking the appearance of the eruptio
which should be favoured by every means possible. Th
internal administration of tonics and a few doses of sulphu
is beneficial. Locally, an ointment of sulphate of zinc o
sulphur may be applied, and the parts kept scrupulousl
clean by bathing with warm water once or twice daily
drying the parts thoroughly afterwards with a very sof
cloth. If fever be well marked, a few doses of febrifug
medicine may be given; violent astringents locally ar
uncalled for. The food should be the best procurable
and of a kind nutritious and readily digestible, as well as o
a laxative character. The animal should be placed in
large, airy loose-box; the box should be large, so that th
animal may be able to exercise himself to a certain extent

VARIOLA VACCINIA

The occurrence of variola is more common amongs
cattle than any other class of animals. The disease, whic

is also commonly known as cow-pox, is one of frequent occurrence in every quarter of the globe; as a rule, it is not attended with any great fatal It is an eruptive pustular disease, and may occur in connection with any part of the body, but is usually confined to the udder. In England it has been observed to occur with greatest severity amongst cows that are kept housed up. The contagium exists only in the fixed form.

Symptoms.—Pyrexia is invariably present, and may, or may not, be well marked. The flow of milk is arrested to a greater or less extent. As a rule, the decrease of milk, while noticeable, is slight. The appetite is observed to be impaired to a certain extent, and rumination may be suspended. The thermometer indicates a slight rise in the temperature of the animal. The skin of the udder and teats presents a reddened or slightly inflamed appearance, and, after awhile, red patches occur upon which appear small red nodules, known as papulæ. This stage is known as the papular stage, and lasts three or four days. The papulæ gradually take on the character of vesicles, becoming filled with serum or lymph, and, like the vesicles in 'variola equina,' are depressed in the centre as though bound down, and are surrounded by deep red areolæ. This stage is known as the vesicular or second stage of the disease. The vesicles now gradually begin to take on the character of pustules, the contents becoming purulent, and the third or pustular stage of the disease is now reached. Four or five of these pustules may be upon one teat, and each the size of the end of the finger.

Treatment.—Absolute cleanliness must be observed. A simple ointment, as calamine ointment, may be applied locally, and a few doses of febrifuge medicine should be administered. A mild laxative may be given with beneficial results. The animal should be fed upon good food of a laxative character, and given in proper quantities. Great care must be exercised to prevent exposure to draughts of cold air, taking cold, etc. Any ointment that may be applied locally may be improved by the addition of a small quantity of carbolic acid. The animal should be carefully isolated from other animals, and the milk should not be used. The person attending to the affected should not be allowed to attend to those animals unaffected, as the contagion can in this way be carried from one animal to another. The lymph, or vaccine matter, used to vaccinate people for purposes of protection against small-pox, is obtained from cattle suffering from this disease. One attack secures immunity from subsequent attacks.

VARIOLA OVINA

Variola ovina, or sheep-pox, occurs in two forms. In one form it is mild and by no means a serious disease, but in the other form, which is described as 'malignant,' it is very severe, similar to small-pox in the human family and is very fatal. In the benign form the vesicles appear scabs form, and in due course of time fall off, leavin depressions in the skin, and wool never grows upon thes parts again.

Symptoms.—No vesicles appear in the malignant, as i the benign form of the disease. The fever is well marked The pulse is quickened, the animal dull and dejected and the animal temperature becomes elevated in some case to 108° F. The eruption is first observed as small re points, which, gradually increasing in size, frequentl become confluent. The febrile symptoms are not so sever in those cases where the eruption is well marked. Ther is usually diarrhœa, and the urine is scant in quantity an high in colour.

Treatment.—Like all fevers, it must not be checked in i course. A few doses of febrifuge medicine may be given; chalk may be administered to prevent or relieve diarrhœa, and the patient should be protected from draughts, etc., nursed carefully, fed well, and given tonics.

CHAPTER XXV

CASTRATION

Castration is usually performed when the colt is about one or two years old, which, taking everything into consideration, is the best age for the performance of the operation. It may, however, be performed on animals very much younger, or a great deal older, than the age mentioned. If it is desired to have the horse heavier in the forehand—that is, improve the neck and forequarters—the desired object may be effected by allowing the animal to attain an age of two or three years, or, in certain rare cases, four or five years, before operating. Removal of the testicles may be effected in various ways, and there is every now and then some new method of operating introduced to the notice of the profession, the latest being the operation with the emasculator, which has rapidly sprung into favour. Castration is usually performed during the spring. The months of May, June, and September, being temperate, are good months in which to perform the operation, and no animal should be subjected to it when the weather is excessively warm, or very cold, as in warm weather the flies prove a great source of annoyance to the animal, collecting around the wound, and depositing their ova, as a result of which, in a few days, it may be a mass of maggots, and sufficient irritation set up to cause the death of the animal; while in cold weather the animal, especially if allowed to run out, will be likely to take cold in the wound, in which case a fatal result may be expected to occur. As a rule the colt should have a run at grass for ten days or a fortnight before being operated upon. The system is in this way cleared of all morbid material and the animal fitted for the operation. A mature hors should be in the best of condition—that is, in medium flesh, hard, and perfectly free from disease of any kind. A horse may be taken out of harness and operated upon immediately, providing he has been working for some time and is hard and healthy. In such a case bad results rarely occur. Race-horses in training are often castrated, suffering very little inconvenience, rarely missing a feed or showing the slightest constitutional symptoms in consequence o the operation. An animal that has been kept housed up in a badly-ventilated or filthy place should not be operated upon, neither should one just recovering from or whil suffering from disease, particularly such diseases as are o a highly debilitating character, as influenza, strangles, etc In case such an animal is operated upon bad results ar almost certain to follow. The operation should never b performed in the neighbourhood of a dissecting-room, o any tainted locality, as, for instance, in the immediat vicinity of heaps of manure, decomposing material, etc. or serious results may be expected to follow. Besides, th hands, and *instruments* in particular, should be scrupulousl clean, and it should also be borne in mind that the clothin of the operator is capable of conveying infection, or an morbid material, the introduction of which into the anima economy may cause a severe and possibly fatal case o blood-poisoning. Before operating, the animal should b made to undergo a few days' preparation. If gross, h may be given a mild laxative and fed well, exercised moder ately, etc. No food should be allowed for several hour before operating, as the animal will not stand the operation so well when the stomach and bowels are full as when they are empty, and there is always more danger of rupturing in these organs during the struggling and casting. On the same principle the animal should not be allowed to exercise himself in a violent manner, or drink a large quantity of water, immediately before being operated upon. Some operate upon the animal whilst allowing him to retain the standing position. This method, while slightly inconvenient, is by no means difficult, neither is it attended with much danger, as the animal almost invariably submits and ceases all opposition on feeling the knife pass into the testicle. But the operation thus performed is highly objectionable, for the following reasons: Some animals will not allow the parts to be handled at all, and the operator, whilst endeavouring to get hold of a testicle, may be kicked and sustain a serious injury. Again, hernia may be present, and on opening the scrotum the bowel may be wounded, or descend to the ground and be trampled upon, and the death of the animal thereby caused. In any case, if hernia be present and the bowel escapes injury, it becomes necessary to cast the animal at once, for the purpose of reducing the hernia. There are also other antiseptic reasons why the animal should be cast before being operated upon, that need not be discussed here. The only argument that can be employed in defence of the performance of the operation upon an animal without casting him is that he may sustain injury while being cast; but such an argument may justly be regarded as a very weak one, when it is taken into consideration that with proper precautions, etc., injury is a very rare occurrence indeed, probably not occurring more than once in a thousand times. Even if injury to the animal occurred with far greater frequency than it does, it would still be better to cast them for the operation, as an occasional broken back or sprained muscle in a horse are undoubtedly matters of far less importance than similar injuries to the person operating. There are various ways of casting and securing the animal, each method probably possessing some individual advantage over the others. It would be impossible to explain the different ways of casting, except by a practical demonstration. Suffice it to say that th easiest and gentlest method by which the animal can b placed upon the ground is the best. He should never b cast upon a hard surface, unless such be covered first with some soft material, as a deep bed of straw or hay, etc After casting the animal he may be placed upon his sid or upon his back, as preferred by the operator. The sheat and penis should be carefully cleansed by washing with ho water, and lubricated afterwards. An examination shoul now be made to ascertain whether hernia be present, i which case it will be necessary to castrate the animal b what is known as the covered operation. If the hernia b small, the operator should expose the tunica vaginalis an place the clamps upon it. If the hernia be one of larg size, the clamps should be placed over scrotum and all, an the parts allowed to slough off. In the absence of an abnormal conditions, the operation may be proceeded wit in any of the following ways, as preferred by the operator

The first step consists in taking a firm grasp of one o the testicles, preferably the smallest. It should be graspe in such a way as to cause a firm stretching of the scrotu over the gland. A castrating-knife, several varieties o which are to be had, should now be used, with which bold incision should be made. The incision should b made close to the raphe, and carried pretty well forward in which case proper drainage of serum, pus, etc., from th wound will be insured. On making the incision the testicl immediately escapes from its coverings, and the rest of th operation may be conducted according to any of the following methods:

Caustic Clams.—This is a very old as well as a successful method, and consists of placing two wooden clams (or metallic clams, the former, however, being preferable) upon the cord, and securing them firmly and in such a manner as to shut off the circulation. The clams are two pieces of wood, each about one foot in length, with a groove running down the centre, which is intended for the reception of a caustic paste or ointment, as the biniodide or perchloride of mercury. After the clams are securely placed, all the tissues beneath should be removed with a sharp knife, and the animal allowed to rise. The clams may be allowed to remain on for twenty-four hours, after which time they should be carefully removed, as, if they are removed carelessly or torn off in a rough manner, a serious hæmorrhage may ensue.

Actual Cautery.—Castration by this method was much practised in France and England until recently, and is essentially the same method as that last described. Having exposed the testicle, a steel or wooden clam, wood being preferable is placed upon the cord in such a manner as to check the circulation. The next step consists in severing the cord about half an inch below the clams, after which an iron at a medium heat should be used to sear the open mouths of the bloodvessels, the end of the cord, etc. The iron should not be too hot, or it will not effect the desired object. Some operators do not use the knife at all in this operation, but expose the testicle, divide the cord, etc., with the hot iron. But such an operation entails much unnecessary pain, although the results are generally excellent. Castration by this method is very successful in the sequelæ attained. It is by far the safest, too.

Ligature.—The use of a ligature to arrest the hæmorrhage resulting from division of the arteries in the operation is undoubtedly the most surgical of all methods employed. It is, however, objected to by some practitioners of great experience, who claim that the method is not a successful one, being frequently followed by bad results; but why such should be the case is not very apparent. The method, as pursued by some, of ligating the whole cord, is, of course, highly objectionable, and likely to be followed by bad results. The operation, as properly performed, consists of applying the ligature to the artery only. The non-vascular structures should be divided with a sharp scalpel. Having reached the spermatic artery, it should be drawn out to a slight extent, and the ligature applied in a secure manner. The artery, being convoluted, should be drawn out to straighten the free end, so that ligation may be properly performed. Division of the artery may now be effected below the ligature, and the animal allowed to rise. The ligature should be of strong silk, and should be rendered thoroughly aseptic. Sometimes enormous swelling follows this method of operating, and it is not one which can be advised for the young practitioner to commence with. It is the most surgical theoretically, but the one which gives, in the horse, the most variable results.

Torsion.—Castration by torsion is a very successful as well as humane method of performing the operation. Having exposed the testicle, some operators place clams or forceps made for the purpose upon the cord. It is preferable, however, to first divide the non-vascular portion of the cord, and place the clam upon the vascular portion. These should be held, or steadied, by an assistant while the surgeon applies a pair of forceps to the vascular portion of the cord, and begins to turn them steadily and slowly until the tissues give way. The arteries will be the last to give way.

When thorough division of the cord is effected, the clams or forceps should be removed, and the cord allowed to escape. From fifteen to twenty five turns of the forceps will be required to accomplish thorough division of the tissues. Hæmorrhage rarely follows the operation by torsion; in case it does occur, it may be checked by touching the mouth of the bleeding vessel with a hot iron, or by applying a ligature. A trivial objection made by some practitioners is that torsion occupies too much time. The forceps must not be put on too close to the clam.

Ecraseur.—The operation of castration with the ecraseur has now been for some time before the notice of the profession. It has some advantages over other methods, especially over the actual cautery, in places where a fire is not readily obtainable close at hand; it has also some disadvantages. The chief difficulty consists in getting a proper instrument. It should not be too sharp, or it will make a clean cut similar to that of a knife, and hæmorrhage is certain to follow; on the other hand, it should not be too dull, or separation of the tissues cannot be effected except by pulling them apart—a proceeding that is equally certain to be followed by hæmorrhage. On using an ecraseur for the first time, it is advisable to place clams upon the cord as a precautionary measure in case hæmorrhage takes place. The practitioner should get a good strong ecraseur, see that all its parts fit well and work smoothly, that it is neither sharp nor dull, but occupies a medium place between the two extremes. A duplicate chain should always be held in reserve in case the chain in use breaks. It is one of the best instruments for operating upon an animal in the standing position. After casting the animal, and exposing the testicle, the chain of the ecraseur should, if long enough, be passed over the testicle; or, if too short, one end of the chain may be removed from its slot, and the chain passed around the cord above the testicle and again secured. The chain should now be drawn up so as to closely embrace the cord. The slack may be taken up by a few quick turns of the screw. As soon as the chain begins to compress the cord tightly, the revolutions of the screw should proceed more slowly, and should be steady. In a few seconds the chain completes its passage through the cord, the latter escapes into the canal, and the operation is finished, no loss of blood having occurred except such as results from a slight venous hæmorrhage taking place from the scrotum, etc.

Scraping.—Division of the cord by scraping it with a knife is sometimes practised, and is the method usually followed in China. This operation may be performed successfully in young animals, but is accompanied by considerable risk.

Bruising the Testicles is a barbarous practice, and deserving of no notice.

Emasculator.—This instrument is shaped almost like a pair of wire nippers, and has a cutting and a blunt edge. It is very rapid in action, and, if a good one is obtained, is far before all others in convenience. There are several patterns, the principle of each being practically the same. It is used very largely in America and England.

CASTRATION (RESULTS OF).

The results of castration are normal and abnormal.

Swelling.—There is usually more or less swelling of the parts observed, in a day or two after the operation. This may be considered as a normal result, and so long as no constitutional symptoms are manifested, as fever, loss of appetite, etc., needs no comment. The swelling may take on an œdematous character, and cause phymosis, in which case relief may be afforded by puncturing or scarifying the swollen parts, and bathing nicely with tepid water; the food should be of a laxative character, and the animal should be exercised gently every day, or turned out on pasture.

Suppuration.—Suppuration is a frequent result of castration, and almost invariably follows the operation; the amount depends largely upon the surgical and antiseptic cleanliness exercised at the time of operating and the chances of infection since. When the discharge is unhealthy in appearance—is fetid in odour, or no discharge takes place, and the pulse quickens, febrile symptoms appear, etc., the case is doing badly, and the parts should be fomented, the wound carefully searched and opened, syringed with antiseptic fluids, and thoroughly cleansed. If necessary, the patient must be cast to do this.

Adhesions.—Whilst operating, the surgeon may meet with strong adhesions between the tunica albuginea and the tunica vaginalis; these adhesions may be broken down with the fingers, or handle of the scalpel, or may be dissected away.

Pain.—Pain may be regarded as a normal result of castration, and may occur in connection with the cord, or may be due to a slight attack of colic, etc., in which case relief may quickly and certainly be afforded by the administration of a dose of opium, subcutaneous injections of morphia, etc.

Secondary Hæmorrhage.—Secondary hæmorrhage sometimes occurs a few hours afterwards, or the bleeding may be resumed immediately the animal rises to his feet. If it is a hæmorrhage of an alarming character, the animal should at once be recast, the artery searched for and seized with the artery forceps, and a ligature applied. Sometimes it is found to be very difficult or almost impossible to get hold of the cord or bleeding vessel, and in such a case the scrotum should be plugged with tow or cotton, the plug saturated with a styptic, and retained in place by means of sutures through the scrotum; in some cases there may be internal hæmorrhage, and an animal may even bleed internally to death. The plug should be removed in twenty-four hours or so, and the clotted blood allowed to escape. In cases of slight hæmorrhage the application of cold water and other refrigerants, without casting the animal, will usually be sufficient. If cold does not stop the hæmorrhage a styptic, such as perchloride of iron, should be applied. In cases where the wound closes too soon, it should be re-opened by breaking down the adhesions with the fingers, after which bathe with antiseptic solutions, such as creolin, carbolic, chinosol, etc.

Peritonitis.—Peritonitis may follow the operation when it has been performed in a bungling or rough manner. Drawing the cord down too far when castrating the animal may predispose to an attack, as may the use of too much caustic when the operation is performed with the clams. It may also be caused by exposure to cold weather, etc.; in fact, anything that acts as an irritant to the parts may give rise to an attack of peritonitis. It is more often than not due to septic infection either at the time of operating or subsequently by want of cleanliness. Lying on a dirty floor is a frequent cause. It is by no means an uncommon result, and when it occurs usually appears about the third day after the operation has been performed, and occasionally is observed even when the operation of castration has been performed under the most favourable circumstances. It manifests itself in the usual way, and should be treated as an ordinary case of peritonitis. For treatment, etc., see 'Peritonitis.'

Tetanus.—Tetanus as a result of castration may occur irrespective of the method employed, or the condition of the animal at the time of operating, hence the surgeon performing the operation should not be blamed. The disease usually appears about the time the wound begins to heal nicely; it is always due to infection by the tetanus bacillus, which gains its entrance through the operation wound. This is one great argument for use of disinfectants and cleanliness. The organism of tetanus finds its chief hiding-place in dust and garden-earth. It may also occur as a coincidence, that is, a case of traumatic tetanus may result in consequence of the presence of some other trivial wound without being in any way influenced by the large wound, but the position of the castration wound renders it very liable to infection. See 'Tetanus.'

Hernia.—Hernia may be present at the time of the operation, or may occur shortly after castration. If very great, the animal lies down of his own accord in the majority of cases; but if he does not, it becomes necessary to cast him. As a rule the hernia exists previous to the operation, hence a careful examination should invariably be made before operating, to ascertain the presence or absence of hernia. A portion of the bowels may descend to the ground and become badly torn or lacerated by the animal stepping upon them; if they have sustained any such injury the animal should be destroyed immediately, as the case is, of course, a hopeless one, admitting of no remedy whatever. However, if the bowels are not lacerated, a cure may be effected. They should be gently and thoroughly cleansed by washing with antiseptic fluid, after which they should be carefully passed back into the abdominal cavity and retained by means of clams placed over the tunica vaginalis, or sutures may be used; the scrotum also may be clamped or sutured, a cooling diet prescribed, and the animal kept perfectly quiet for a few days, and as a rule the cure will be a permanent one. See 'Hernia.'

Abscess of the Scrotum.—Abscess of the scrotum may also occur as an abnormal result of the operation of castration. In some cases it may be directly due to the imprisonment of pus, in consequence of an insufficient opening having been made into the scrotum and tunica vaginalis. The entrance of pus organisms—introduced by the contact with foreign bodies—will give rise to abscess of the scrotum, and fistulous openings may also be present; as a rule this formation of pus is noticed about two or three weeks after the operation. The symptoms are the same as those of an abscess occurring in any other part of the body; more or less swelling takes place, the scrotum feels hard and tense, pressure causes pain, etc., and usually a little opening can be seen in the scrotum. In many cases the abscess is situated high up, nearly to the abdominal ring.

Treatment.—The treatment consists in reopening the original wound made in castrating the animal; it should be opened to the bottom; in some cases it may be necessary to use a probe several inches in length to reach the pus; the parts should be well fomented and the wound should be kept open, being syringed carefully several times a day with antiseptic fluid, such as solution of Jeyes' Fluid, chinosol, or carbolic acid. Slight lameness may arise from irritation in this quarter, but it is only a symptom, and will disappear with the cause. In some cases when opening the parts freely, a considerable amount of hæmorrhage may occur, but not to a dangerous extent; a laxative may be given the animal, and if septic poisoning is apprehended benefit will result from the internal administration of sodium hyposulphite or carbolic acid. If the abscess is neglected and breaks internally, it will cause the death of the animal. It is absolutely essential that the pus is released externally. Often these cases prove very troublesome, the patient is very much pulled down, and requires tonics and nourishing diet for a very prolonged convalescence.

SCIRRHOUS CORD

Scirrhous cord, or champignon, consists of a cauliflower-like excrescence, or growth, involving the free extremity of the spermatic cord, and results in consequence of the invasion of the castration wound by small vegetable parasites known as 'discomyces.' Protrusion of the end of the cord through the operation wound and adhesion, whereby the wound is left open for a very long time, is a predisposing cause, because it gives the organisms a chance to gain a good foothold. If adhesions are observed to exist after the operation of castration, they should be broken down and the cord pushed up into the inguinal canal. In this way schirrous cord may often be prevented. When champignon is of short standing—of two or three months, for instance—its extirpation may easily be effected; but in old cases of long standing, in which the excrescence has, perhaps, attained the size of a man's head, new blood-vessels have formed, etc., the operation becomes one of considerable difficulty and danger, the hæmorrhage resulting from the removal of such a growth usually being of a most alarming character.

Symptoms.—Great irritation exists in connection with the cord and the surrounding structures, which causes a severe drain upon the vital energies of the animal. He gradually falls off in condition and becomes dull and listless, and there is usually stiffness or lameness observed during progression, with many other signs of pain. In some cases there is a tendency to suppuration, fever, great debility, exhaustion, and death.

Treatment.—As it is evident that the symptoms presented of irritation, pain, etc., are due to the presence of the fungoid growth upon the free extremity of the cord, it becomes equally apparent that the removal of the source of irritation will be followed by cessation of the symptoms, and a cure effected. Hence the animal should be given a day or two of preparation, and the system got in as good condition as possible. The patient should be cast and firmly secured, the adhesions between the fungous growth and the scrotum should be divided, and all other adhesions existing between the cord and neighbouring structures should also be broken down. The practitioner should make it a point to free the whole of the mass from the surrounding tissues, which having done, he may proceed as follows to remove: Place the clamp upon the cord above the eased portion, and proceed as for castration—cutting the champignon away, the resulting hæmorrhage may be arrested in any of the ordinary ways, as by the actual cautery or ligature. Styptics will rarely suffice, and alone should not be trusted to. In cases where the cord is diseased high up, the clamps cannot be applied. A very good instrument with which to remove a growth of this kind is the ecraseur; but in the case of a very large tumour severe hæmorrhage may follow its use. Slow and steady torsion may sometimes be practised with success in the removal of champignon. Frequently removal of these growths is attempted by the employment of caustics, and the actual cautery, as plunging a red-hot iron rod longitudinally through the diseased mass. Such practices, however, are barbarous and cruel in the extreme, and should be discountenanced. The after-treatment consists in allowing the animal plenty of food of an easily digestible, nourishing, and laxative character, and, after a few days, gentle exercise.

In some cases the growth is too large to remove with safety. It may first be reduced in size (and in some cases will altogether disappear) by the persistent administration two or three times a day of potassium iodide, or biniodide of mercury and potassium iodide together. In any case it is a good plan to administer one or other of these medicines for a few weeks after the removal of the growth. If the whole of the scirrhous cord cannot be removed at once a portion of it should be taken away, and in many cases the whole of it will disappear.

In all cases antiseptics should be used freely to the wound, iodine lotion being probably the best.

Amaurosis.—Amaurosis occasionally occurs as a result of castration, and in most cases is due to excessive hæmorrhage. The condition sometimes lasts for several days; but as the animal regains strength it usually disappears. In some cases, however, blindness becomes permanent.

CHAPTER XXVI

Diseases of the Organs of Generation (Female)

METRITIS

METRITIS, or inflammation of the womb, is most frequently met with amongst cows and ewes, but occurs in all mammalia. When it occurs in the mare, it may be as a result of the improper use of obstetrical instruments, or the injudicious employment of force, during the act of parturition. It may also be caused by exposure to cold or invasion by micro-organisms soon after foaling. If the whole of the womb-substance is affected, the most probable termination is death.

Symptoms.—The animal shows slight uneasiness, which increases, becoming better marked as inflammation proceeds.

Soon considerable pain is manifested, and the patient may lie down and roll. When standing, more or less arching of the back may be observed; the pulse-beats increase in frequency; the temperature heightens, and greater than ordinary thirst is manifested, all the symptoms of pyrexia making their appearance in a well-marked form at an early period of the disease. The appetite, at first impaired, finally becomes lost altogether, the animal refusing every description of food. Urine is passed frequently, and occasionally a reddish or brownish fluid escapes from the vagina. The bowels are generally constipated, cold sweats break out in patches over the body, the countenance becomes haggard and anxious, and unless the condition be speedily relieved death quickly occurs. An examination per rectum, or through the vagina, reveals increased heat of the womb, and may cause the animal to evince pain. Inflammation of the womb in a virgin mare rarely, or never, occurs.

Treatment.—If the pulse is found to be strong, full, and bounding, Fleming's tincture of aconite, in the usual doses, will be found useful to control the heart's action, and combat the progress of inflammation. Opium or belladonna may be freely given to allay pain. Hypodermic injections of morphia may also be administered for the same purpose, and have the advantage of acting very quickly. The patient may be afforded great relief by enemas of tepid water. The cavity of the uterus should also be injected with tepid water containing a proper proportion of antiseptic. If the animal is in a comfortable place, well protected from cold, draughts, etc., great benefit will accrue from the application to the abdomen of blankets wrung out of hot water, and covered with dry blankets. Mustard, strong stimulating liniments, etc., may be applied as counter-irritants. An oleaginous laxative may be given, if thought desirable. If the discharge remains after the irritation ceases, the womb should be injected twice or thrice daily with a solution of carbolic, creolin, or chinosol. The patient should be kept very warm. If perspiration can be induced in the acute inflammatory stage of the disease, it will usually be followed by a marked improvement. In cases of metritis in the mare arising from the use of instruments, or the employment of force during the act of parturition, a fatal termination may be expected, the mare not standing the use of obstetrical instruments as well as the cow. In those cases not due to injury, recovery may usually be expected to take place.

Endometritis.—Endometritis signifies inflammation of the mucous membrane lining the uterus. It is not so serious a condition as the one previously described. The causes, nature, symptoms, treatment, etc., are practically the same as in metritis.

LEUCORRHŒA

Leucorrhœa, or, as it is frequently termed, the Whites, is a disease of the mucous membrane of the uterus, and sometimes of the vagina, and is characterized by the outpouring of a viscid and somewhat milky-looking discharge, which may be caused by a chronic or sub-acute inflammation of the mucous membrane of the parts, or may be due to a slight irritation caused by retention of a portion of placenta. It is most frequently seen in old and debilitated animals, in such cases debility being the only cause that can be assigned for the disease.

Symptoms.—There may be seen a glairy white discharge constantly issuing from the vulva, and running down the thighs. In some cases the belly is tucked up, in other cases it is more or less pendulous. The disease is a common one amongst cattle, particularly the finer breeds, and is often associated with tuberculosis. Ovarian disease may also occasionally give rise to leucorrhœa. At times there may accumulate large quantities of the mucus, which, on exercising the animal, comes away as described above, and besides being possessed of a fœtid odour, gives the animal a very unsightly appearance.

Treatment.—The treatment of leucorrhœa embraces both constitutional and local measures. The food should be of the best quality procurable, highly nutritious, of a readily digestible and laxative character, and should be allowed in liberal quantities. Powerful alteratives and tonics are indicated, especially iron or potassium iodide. Hydrastis canadensis, belladonna, or atropine will be found useful to check the excessive mucous discharge, besides which the cavity of the womb may be injected with a solution of carbolic acid, or other deodorant antiseptic, in cases where the discharge is very fœtid. After the first injection a weak solution, as one to thirty-six, should be used. Solutions of alum or sulphate of zinc are also useful.

HYDROPS UTERI

Dropsy of the uterus consists of an accumulation of fluid within the cavity of the womb. This condition may sometimes be brought about by retention of the œstral fluids, mucus, etc., and the invasion of micro-organisms.

Symptoms.—The animal is often supposed to be pregnant, but as time progresses gradually falls off in flesh, and on an examination being made, it is found that no fœtus is contained within the uterus. In some cases periodical evacuations take place.

Treatment.—The treatment consists in drawing off the accumulated fluid, which may be done by means of a catheter. After the fluid has been drawn off, astringent lotions should be injected into the uterine cavity. Iron tonics should be given internally, and the uterus injected with astringents or antiseptics. Solutions of alum, zinc sulphate, chinosol, creolin, or carbolic acid are all useful. In some cases there may be a dead and decomposing fœtus in the womb, which must be removed, and the abovementioned treatment employed. In the smaller animals the whole uterus may be removed by a surgical operation.

Tumours.—Tumours of various kinds are occasionally met with in connection with the uterus. They occur most frequently in old and debilitated animals. They can be removed, but in a majority of cases it is not worth while to attempt their removal.

VAGINITIS

Inflammation of the vagina may be due to contagious influences. It frequently follows difficult parturition, especially in cases where the use of obstetrical instruments becomes necessary. Exposure to cold after parturition will also cause vaginitis, as will the forcible introduction of foreign substances into the vagina, as fork handles, etc., by mischievous boys. Injuries may be received during coition, especially if the penis of the stallion is of an extraordinarily large size.

Symptoms.—The mucous membrane of the vagina on being examined is found to be reddened, hotter than natural, and painful. At first it is dry, but soon is moistened by a copious discharge.

Treatment.—A mild laxative should be given, and followed by febrifuges. If the pulse is higher than normal, and full, aconite is useful to correct it and lower temperature. Soothing applications should be made to the walls of the vagina, injections of warm water being very useful to allay irritation. A decoction of poppy-heads, with lead acetate, alum, or zinc sulphate is useful as an injection. If the discharge persists after the acute symptoms have disappeared, iodide of iron or iron and quinine should be administered, as often as may be deemed necessary in the judgment of the practitioner. They are amongst the most useful tonics known to arrest excessive discharges from mucous membranes in all parts of the body. Good food in liberal quantities, mineral and vegetable tonics, etc., may be given in the convalescent stages.

Vulva, Abscess of.—Abscesses occasionally occur in connection with the vulva, being caused by injuries of various kinds. The symptoms are those of abscess occurring in any other part of the body. The treatment is also the same as for abscess anywhere else.

Vulva, Closure of the Lips of.—This condition is one not very commonly met with. It occurs in consequence of injuries to the mucous membrane of the vulva, and may follow parturition weeks afterwards. Debility, in all probability, also exe. s a certain amount of influence in the production of this condition.

Treatment.—The treatment merely cor. ts of separating the lips of the vulva, which may usuall, be done with the fingers. In case separation cannot thus be effected, a scalpel should be used to separate them. The irritation thus set up, or that may have existed previously, may be allayed by fomentations, astringent lotions, and, lastly, with cold applications, which will also give tone to the parts. A pledget of tow, cotton, or some similar soft mat ial, saturated with a bland oil, should be inserted between the lips of the vulva to prevent adhesion. The pledget should be replaced every time it becomes displaced. In a day or two no further danger of the vulva closing need be apprehended.

PROTRUSION OF THE VAGINA

Protrusion of the vagina is a by no means uncommon condition, and may follow difficult parturition, especially in those cases where the fœtus is dragged by main force from the mother. It may also be caused by an animal lying upon a sloping surface, with the hind-quarters much lower than the rest of the body. Constipation, or anything that causes an animal to strain, will also cause it. In many cases an insufficient supply of food, damaged food, debility, etc., play an important part in the production of this condition. Sometimes the vagina will bulge out and present a reddened tumour-like mass, larger than the closed fist of a man, frequently causing the condition to be mistaken for inversion of the uterus. A manual examination of the parts will, however, reveal the true character of the trouble. It has been known to be a cause of sterility.

Treatment.—If the protruding portion of the vagina be irritated or dirty, it should be carefully cleansed by washing in antiseptic solution, and opium or belladonna may be added to allay irritation. The parts should now be gently forced back into place, and the hind-quarters of the animal elevated several inches. In some cases it may be necessary to place sutures in the lips of the vulva, to retain the vagina in position. Astringent injections into the vagina will be found useful. Enemas to clear out the rectum should be given frequently; and a mild laxative may be administered. Straining on the part of the animal may be prevented by the administration of opiates. The diet should be of a laxative character, highly nutritious, and allowed in liberal quantities. In many cases an operation is necessary.

Clitoris.—The clitoris may become diseased in various ways, such conditions being most frequently noticed in old and debilitated mares. Tumours of various kinds sometimes occur in connection with this organ. For such growths, when of a malignant character, very little can be done. In some cases the clitoris may be ulcerated or otherwise diseased to such an extent as to necessitate its removal. The operation is by no means an unimportant one, [illegible], and should not be performed except [illegible] necessity.

OVARIAN DISEASES

Enlargement of the ovaries sometimes comes under observation, and tumours of a fibrous or encysted character are occasionally met with in connection with these bodies, encysted tumours being the most common. Ovarian diseases are most frequently met with affecting old cows and mares that have been bred several times, and attention is drawn to it because they suddenly refuse to breed, although they are frequently seen in mares which have never had a foal.

Symptoms.—The mare steadily refuses the horse, or may allow herself to be covered a number of times, but fails to conceive. In a short time she begins to fall off in flesh; œstrum may be manifested regularly, and may extend over a longer period than it should; slight abdominal pain may frequently be manifested by the animal; and there is usually a well-marked and increasing irritation of the urino-genital system, and a slight muco-purulent discharge from the vulva. The animal has a generally unthrifty appearance; tires easily, etc. If the ovaries are enlarged to any great extent, an examination per rectum will reveal the fact. In some cases they attain an enormous size, and may even produce death. There is not in all cases a discharge from the vulva.

Treatment.—The condition can only be remedied by the performance of a surgical operation. If a tumour, its removal necessitates an operation of the most delicate character. Perhaps the best method in such a case would be to remove the ovary with the tumour—constituting the operation of ovariotomy, which will be described further on.

Ovaries, Dropsy of.—One or both ovaries may become greatly distended with fluid, giving rise to no well defined symptoms, except the general symptoms of ovarian disease.

Treatment.—In some cases the accumulated fluid may be successfully removed by puncturing the ovary, but it usually re-fills. A course of potassium iodide may be tried to prevent further accumulation of fluid, but it is of questionable value.

Œstromania.—Œstromania, or perpetual bulling, as it is very commonly called when occurring in the cow, is due to some abnormal condition of one or both ovaries. Such an animal is a bad one to have in a herd, as she keeps the rest of the cows as well as herself in a constant state of excitement. She falls off in condition, has a variable and perhaps depraved appetite, and is always ready to receive the male. Occasionally such an animal will conceive; but as a rule they never become pregnant, and are a continual source of trouble.

Treatment.—The symptoms may be allayed by the administration of large doses of opium. Potassium bromide may also be given with advantage in many cases. However, the best and only effectual method of treatment is removal of the ovaries. The operation being known as ovariotomy when the ovaries are diseased, or oöphorectomy when they are normal, and the operation is done merely in order to unsex the patient.

Nymphomania.—This disease, or condition, as in many cases it cannot be called a disease, is essentially the same as the one just described under the head of œstromania. The symptoms and treatment are the same.

Ovariotomy.—This operation has been known for a great number of years, and at one time was practised to a very great extent, but at the present day is not so commonly performed by the veterinary practitioner except with a view to the cure of disease. It is claimed that the removal of the ovaries from a milch cow causes an improvement both in the quality and quantity of the milk, and that she will continue to have a full flow of milk every day for several years in succession. It is also claimed that such animals require less food, and are preferable in every way to animals in which the ovaries have not been removed. The operation is frequently performed upon pigs, with a view of preventing impregnation. It is also claimed that they fatten quicker, in consequence of the ovaries being removed; that such is the case has been proved by many operators, especially, in recent years, Flocard of Geneva, who has published records of several thousands of cattle. Observations made in England during the past three years and published in the veterinary journals also confirm this view, and indicate its value for troublesome mares. The operation used to be performed by cutting into the side of the animal, the right side usually being selected in cows. In dogs and cats it is performed by cutting into the abdomen through the median line, this method being very successful. Chartier's method of operating consists in passing the hand into the vagina, through the walls of which, at the upper part of the passage, and two or three inches posterior to the os uteri, an incision is made; the broad ligament is found, and the ovaries drawn out and moved—preferably by means of a special ecraseur. In some cases the ovaries may be removed with a knife, and the bloodvessels closed by means of a ligature, which will in time become removed by absorption, and cause no irritation whatever. In all cases the strictest adherence to antiseptic precautions must be observed, and the patient should be anæsthetized. In the pig, however, some exception may perhaps be made to the use of anæsthetics, as an expert operator will usually perform the whole operation completely, from start to finish, in thirty seconds. In country districts the ordinary gelders do many thousands, without the least knowledge of antiseptics or even ordinary cleanliness, and a death is a rarity. Some surgeons make an incision on each side when removing both ovaries. Such a procedure is entirely unnecessary, an opening on one side being sufficient to remove them. All unnecessary pulling, etc., should be avoided, the operation being performed as gently as possible. The hands and instruments ought to be scrupulously clean, and antiseptic lotion should be used. After the operation, the lips of the external wound are secured in place by means of sutures. In the dog or cat the skin wound is then covered with iodoform celloid. Keep the patient quiet a few days, and do not overfeed.

CHAPTER XXVII

Pregnancy, Parturition, and their Results

THE FŒTAL ENVELOPES

The chorion is the most external of the fœtal envelopes, and is intimately connected with the uterus, having its form, etc. The amnion is the most internal of the fœtal coverings, immediately surrounding the fœtus, and is the membrane which secretes the liquor amnii. Between the chorion and the amnion is found the alantois, which is somewhat similar to a serous membrane, in having two coats. During early fœtal life there exists a small pear-shaped pouch or bladder, known as the umbilical vesicle. This disappears as the period of gestation draws to a close.

Placenta.—It is by means of the placenta that the fœtus gets its supply of pure blood. Here it is that the interchange of gases takes place by the process of osmosis, the blood of the fœtus receiving oxygen from that of the mother, and at the same time giving out its carbon dioxide. The placenta in the mare is attached by little tufts or villi to the uterus; while in the cow the attachments are known as cotyledons, and vary in number from sixty to seventy. Retention of the placenta in the mare is very rare indeed as compared with its frequency in the cow. The umbilical cord contains two umbilical arteries and one vein imbedded in a mass of gelatinous material. The urachus passes from the anterior part of the bladder, and terminates in the alantoid cavity. Occasionally a case is met with of a foal two or three days old with the urine dribbling from the umbilical opening, showing that the urachus has remained pervious instead of withering up, as it usually does, to become a ligament for the bladder. The treatment is often disappointing, the urachus being very difficult to close. Strong formalin solution syringed round the wound has been found successful.

GESTATION

The period of gestation in the mare is usually eleven months, but it may vary to a remarkable extent, in some mares being only ten months, whilst in others thirteen months may elapse from the time of conception up to the time the young animal is born. Male foals are carried two or three days longer than female foals; and, as a rule, an old mare carries her foal longer than a young mare. The period of pregnancy with the cow is also subject to great variation, but on an average is nine months and a half. The sheep and goat carry their young about five months; the sow four months; the bitch two months, or sixty-three days; and the cat, on an average, eight weeks. The mare and cow come in heat every four or five weeks, and remain in heat from two to four days at a time.

Abdominal Fœtation.—The fœtus is sometimes developed outside of the uterus, through the ovum dropping down into the abdominal cavity in consequence of the fimbriated extremity of the Fallopian tube failing to grasp it. This condition may terminate in death of the parent as the fœtus increases in size. It invariably terminates in death of the fœtus which may become dried up and remain in its unnatural position until death of the parent from some other cause.

Superfœtation.—A mare having been served by a stallion may occasionally, in the course of four or five weeks, manifest a desire for a second visit from the male; is again served, and conceives both times. This is known as superfœtation. Such a case has been recorded by Mr. G. W. Simpson, of Mackinaw, Michigan; the animal in question, a mare, giving birth to a horse colt and a mule colt, both dead. The mare had been covered by a jack and subsequently by a horse.

SIGNS OF PREGNANCY

The practitioner is occasionally called upon to give an opinion as to the pregnancy, or non-pregnancy, of an animal, and consequently should familiarize himself with the various indications which tend to prove the absence, or presence, of this condition. As a rule, when the mare conceives, heat, or the desire for the male, is no longer observable, and, on being led to the horse, she not only refuses to receive his caresses, but assumes the offensive, viciously striking and biting at him until led away. Soon the coat becomes more glossy, and the mare becomes quieter in disposition. This change is usually well marked in mares that are of a vicious disposition. The abdomen gradually enlarges as pregnancy advances, the right side being a little larger than the left. This enlargement is especially well marked in the cow. In some cases the beating of the fœtal heart may be heard with the assistance of the stethoscope. Such an examination is, however, very likely to give rise to mistakes. After the eighth month well-marked symptoms of pregnancy are manifested, the belly at this time being considerably distended, the back sinking, etc. Before this time it is, however, impossible to make a positive statement as to the condition of the animal except by making a very close and thorough examination per rectum. The rectum should be cleared out by means of an enema of tepid water; the hand and arm should be well oiled and passed into the rectum. The region of the uterus being reached, an examination may be made of its condition. It is also recommended by some practitioners to make an examination through the vagina. Such a procedure is, however, very objectionable, as, in case the animal is pregnant, the irritation thus set up may cause her to abort. As the time for parturition approaches, the ligaments relax to a greater or less degree, and a well-marked depression or sinking in the lumbo-sacral region may be observed, the udder enlarges, and milk is secreted. The secretion of milk sometimes appears long before the time of parturition, and has frequently been noticed to take place in animals that have never been bred. As a rule the animal shows slight uneasiness for a day or two before parturition, slight abdominal pain, etc., being manifested. About this time there usually appears a wax-like substance on the teat; the vulva becomes larger, and presents more or less tumefaction. There may also be observed a flow of mucus taking place from the vulva for a day or two before parturition.

PARTURITION

As a rule parturition is quickly performed in the mare, ten or twenty minutes generally being all the time occupied. The opposite is the case with the cow. Generally speaking, if the act of parturition be protracted to any extent the foal is born dead; while in the case of a cow the act may occupy a day, or longer, and the calf survive. As a rule parturition is accomplished very easily, the animal rarely requiring any assistance. The act may be performed either in the standing or recumbent positions. The colt comes in the water-bag, and when in the natural position the fore-feet and head come first. In some cases the os uteri is not sufficiently dilated to allow the fœtus to pass; the mare strains violently, etc., but without making the slightest headway in the expulsion of the fœtus. In such a case the practitioner should make a careful examination of the parts, and if it is found that the os uteri is insufficiently dilated, it must be remedied, in some cases immediately; in other cases, if a little patience be exercised, by waiting awhile, the os may dilate of its own accord. Injections of tepid water directly upon the part will facilitate dilatation. The same object may, in many cases, be effected by smearing the os uteri with belladonna (soft extract). In cases where dilatation cannot be effected on account of disease of the parts, or for some other reason, it becomes necessary to divide the os, preferably at its superior part. The parts will now be felt to give way, and the hand can be introduced into the uterus without any further difficulty. The practitioner, on being called to a parturition case, should, as a preliminary step, make a careful examination of the parts, and inform himself fully of the position of the fœtus, the condition of the parts, and of every other point that may be of assistance. He should also see that the fœtus is in the proper position before bringing any force to bear on its removal. In cases requiring the employment of force to effect delivery, a disregard of this rule is the cause of most of the failures.

MALPRESENTATIONS

Malpresentation of the fœtus is by no means uncommonly met with. A description of all the abnormal presentations that have been observed would be sufficient to fill a large volume, hence a few only of these conditions will be described. A very common presentation is that in which the head of the fœtus is presented in a proper manner with the limbs turned backward. The practitioner, on making an examination, is unable to feel anything but its head. In such a case the head should be pressed upon and forced back in such a manner as to allow the practitioner to pass his hand into the uterus and grasp the fetlocks, which may now be drawn into proper position. This done, delivery may, as a rule, be easily accomplished. In some cases it may be necessary to place a small rope around the fetlocks—the rope should be of some pliable material, such as cotton or manilla.

Presentation of the legs with the head turned bac constitutes a very difficult presentation, and one that wil give the practitioner much trouble, especially when all th farmers, and would-be knowing ones in the neighbourhood have been hauling and pulling at the fœtus in ineffectua attempts to deliver it before the arrival of the practitioner. The first procedure should be to place a small cotton rope around each fore fetlock. This done, the practitioner should make every effort to get hold of the head and bring it into the proper position for delivery. In many cases it will be found necessary to attach a rope to the lower jaw. Some practitioners use a hook, which may be implanted in many places—the symphysis of the lower jaw usually being selected, when the fœtus is alive, and in such cases a blunt hook should be employed. In case the fœtus is dead, a sharp hook may be employed. After the hook is placed in position, or the rope is attached to the jaw, as the case may be, the fœtus should be pushed back so as to afford the head plenty of room in which to turn. Pushing the fœtus back cannot be very well effected by means of the hands alone, but may be easily accomplished by the use of the repeller, or crutch—the latter name being given the instrument in reference to its shape. As an assistant steadily presses upon and forces the fœtus back, gentle traction is brought to bear upon the head by means of the hook, or rope, and the head brought into position. Nothing further should now be done until a uterine contraction, or labour-pain, comes on, when the ropes attached to the feet and jaw should be gently and steadily pulled upon and delivery effected. All traction upon the ropes should cease with the labour-pain, and be resumed on the appearance of the next labour-pain. In all cases where the mother appears to be suffering from too severe pain, opiates may be administered with benefit.

When the fœtus is found to be lying upon its back, with the back of the head presented, every endeavour must be made to turn it into the proper position. In the case of a very small fœtus, delivery may in some cases be effected without turning it; but in the case of an ordinary-sized fœtus, such an accomplishment would, of course, be impossible. By patience, perseverance, and plenty of hard work, the fœtus may be turned over into its proper position. This result, however, is by no means certain—the practitioner, despite his utmost endeavours in many cases failing to turn the fœtus over.

Occasionally a case is met with in which the hind-feet are presented. Such a case, as a rule, is easily disposed of, not generally causing much difficulty. A rope may be attached to each hind fetlock, and moderate traction exerted simpltaneously with each uterine contraction. It is frequently a matter of great difficulty to distinguish between fore-legs and hind-legs while the fœtus is in th uterus, but as it is a point of the utmost importance tha the practitioner should know, he should never rest until h becomes thoroughly satisfied as to which are presented and until this information is gained, not the slightest effor should be made to effect delivery.

Breech presentation, or presentation of the hind quarter is one in which delivery is very frequently rendered impossible, or can be effected only with the greatest difficulty In the case of a large, strong animal in which ineffectu uterine contractions have been observed for a considerabl length of time, the practitioner may rest assured that h will have plenty of hard work before effecting delivery the young animal, the tail of which may be the only pa in sight. The fœtus should be pushed forward, and a endeavour made to turn it; this object can, however, ve rarely be accomplished, but may be tried until it is se that all efforts in that direction are useless, in which ca a rope should be placed around the stifle or hock joints preferably the latter—after which the practitioner shou insert his hand, push the fœtus forward, manipulate it various ways as judgment directs, and endeavour to g the hind-feet presented, with the legs straightened out in the passage. This done, delivery usually takes place with comparative ease. Sometimes the hocks are found to be tightly wedged in the passage. If the foal is alive—which is frequently a matter of some difficulty to ascertain—the practitioner should proceed in the same manner as directed above. If the foal is dead, and in this position, it usually becomes necessary to perform embryotomy. In some cases the limbs may be found to be jammed in the passage so tightly as to be immovable, rendering the performance of embryotomy very difficult. The chain saw should be introduced, and passed around the limb, and as much of the latter as possible removed from the body. In many cases the limb cannot be severed higher than the hock. After removal of the whole, or a portion, of the limbs presented has been effected, the abdominal cavity of the fœtus should be penetrated, and its contents removed. This may be done with comparative ease, being much easier than separating the fœtus at the sacral or lumbar region as some do. After removal of the hind limbs, and the abdominal viscera, the remaining portions of the fœtus may be brought away with ease. Occasionally a breech presentation is met with in which the fœtus is found to be lying on its back. An endeavour should be made to turn it over into its proper position; this failing, the hind-feet should be grasped by an assistant, and the fœtus pulled upwards. The lifting of the fœtus may be greatly facilitated by placing a broad bandage under the belly of the animal, and each end held by a man who should, when directed, exert pressure in such a manner as to lift the uterus. The practitioner should at the same time guide the fœtus over the brim of the pelvis, when, as a rule, delivery takes place without any more trouble.

Sometimes a case is met with in which the head is protruded, and swollen to an enormous size; the feet are turned back, and the young animal is dead. In such a case the practitioner should remove the head, return the body of the fœtus to the uterus, and get it into proper position for delivery, or perform embryotomy.

Occasionally there may be one fore-limb and one hind-limb presented. In this presentation, if, as is often the case, the practitioner jumps at the conclusion that they are both fore-legs or both hind-legs, and under this impression exerts any force in an effort to deliver the young animal, the most serious results will be likely to occur. In such a case a careful examination of the position of the fœtus should be made; and having ascertained its position, the best method of effecting delivery should be considered. If a posterior presentation be decided upon, the fore-limb should be pushed back, and the other hind-limb secured and brought up by the side of its fellow. If the practitioner concludes that it will be easier to make an anterior presentation, the hind-limb should be forced back into the cavity of the uterus, the fore-limb sought for, and, when found, placed in position by the side of its fellow; the head also placed in position, and delivery effected.

Back presentation is one of the most difficult of all malpresentations to rectify. Every effort should be made to turn the fœtus into its proper position.

Twins are occasionally met with, and in exceptional cases one limb of each may be presented, and force used in an endeavour to bring them both out together, under the mistaken idea that both of the limbs presented belong to one fœtus. When by a careful examination the true state of affairs is discovered, one fœtus should be forced back into the cavity of the uterus as far as may be necessary, and the other one brought forward in the proper position, when delivery will usually take place without further assistance, first of one fœtus and then of the other. If assistance be required, it may be rendered in the ordinary way. After a case of parturition, if the practitioner considers that the young animal is smaller than ordinary, it will be advisable to make an examination of the uterus, to ascertain whether it contains another fœtus. As a rule, when a fœtus dies in the uterus it is expelled. Expulsion does not, however, always take place. On examination, some time after death of the fœtus has occurred, the vagina is found to be more or less irritated, and there may be a fetid, yellowish discharge from the vulva. The decomposed fœtus is to be found in the uterus, and must be removed as quickly as possible. Warm water, belladonna, etc., may be used to dilate the os uteri, after which the contents of the uterus must be removed by the hand: an operation of a horribly disgusting character, as in many cases the decomposing fœtus pulls to pieces, and must be taken away a handful at a time, and at the same time gives rise to an odour so offensive as to be almost unbearable. After the contents of the uterus have been removed, the cavity should be thoroughly cleansed by injections of warm water containing a proper proportion of antiseptic. The above, besides being work of an exceedingly disgusting character, is also accompanied by a considerable amount of danger to the practitioner, whose hand and arm come into contact with the fœtus and the highly acrid discharge from the parts, both of which are very poisonous, almost certain to cause more or less irritation of the hand and arm, and in many cases give rise to severe cases of blood-poisoning, terminating sometimes in death. Especially is the danger great in cases where the practitioner has any wounds or sores of any kind upon his hands or arms. The danger may be lessened by injecting the vagina and uterus of the animal with strong antiseptic solution before inserting the hand

and arm. These latter should also be copiously smeared with carbolized oil, and on becoming dry should be withdrawn, well washed in warm water containing carbolic acid, treated to another coat of carbolized oil, and so on until the contents of the womb have been wholly removed; when the hand and arm have been withdrawn, they should at once be washed at least two or three times, or until thoroughly cleansed, in the carbolized warm water, or some other disinfectant.

The abnormal presentations treated of are those most frequently met with in the mare and cow. Of course the fœtus may be presented in scores of other positions besides those above described. Every abnormal presentation gives rise to more or less difficulty before delivery can be effected. But although he may meet with presentations he has never read or even heard of, the intelligent practitioner will rarely be at a loss in deciding as to the proper method of procedure; and although he may fail to effect delivery in some cases, no blame should be attached to him, as it should be remembered that in certain cases delivery of the living fœtus in the ordinary way is an impossibility. The only way in which it can be removed from the womb is by performance of the Cæsarian operation, which is very difficult in the larger animals. In the smaller animals this operation (hysterotomy) and the removal of the uterus and contents intact (hysterectomy) has many times been done with success.

Monstrosities have been described in varieties almost legion. A monstrosity is a deformed fœtus, and while the presentation may be all right, the character of the deformity may preclude all possibility of delivery ever being accomplished in the ordinary manner. The only method of removing such a fœtus without endangering the life of the mother is by the performance of embryotomy.

'Hydrocephalus' is occasionally met with in the fœtus. The position may be proper, but delivery cannot take place on account of the extraordinary size of the head of the fœtus. The cranial cavity may be punctured, and the fluid allowed to escape, after which, as a rule, the parts collapse and delivery takes place. If, however, the enlargement persists after puncturing, the cranial bones must be broken down with a knife or some other instrument. This is easily done, as they are very weak—the fingers in many cases being sufficient to break them down.

'Ascites,' or abdominal dropsy of the fœtus, is occasionally noticed. As a general thing the fœtus is dead; and if delivered alive, always remains a weakly and unhealthy animal of no benefit to its owner. The fluid may be evacuated by means of a long trocar passing through the body of the fœtus; or the fœtus may be pushed back, an embryotomy knife introduced into the uterus, an incision made into the abdominal cavity of the fœtus, and the fluid contained therein allowed to escape into the cavity of the uterus; after which, the fœtus if properly presented will be delivered with ease.

Occasionally labour pains come on and persist for a considerable length of time; but it is observed instead of being strong and powerful, as they should be, that the contractions are weak, and utterly inadequate to the task of expelling the fœtus. In such a case the bladder and rectum should be emptied, and an alcoholic stimulant administered; the uterine contractions assisted by pressure applied over the region of the uterus; and where the presentation is proper, and no anatomical malformation of the fœtus or mother exists, injections of tepid water into the vagina, and at intervals doses of ergot of rye, smearing the os uteri with belladonna, will frequently bring about delivery.

PARALYSIS OF THE ABDOMINAL MUSCLES

Paralysis of the abdominal muscles, or loss of power of the muscular walls of the abdomen, is occasionally noticed in pregnant animals, and more particularly during parturition. The condition is in all probability, at least in a majority of cases, caused by general debility.

Symptoms.—The abdomen becomes greatly distended, and pendulous, in some cases reaches nearly to the ground, and when the animal lies down, the fœtus in the womb presents an appearance similar to that of a large mass or body in an ordinary wet sack. Very little can be done for this condition, except to bandage and support the abdominal muscles, administer nerve tonics, allow nutritious food, etc. In certain cases it becomes an act of mercy to destroy an animal that has become exhausted by pain and long-continued and ineffectual efforts to expel the fœtus. So long, however, as the pulsations do not increase in number, or the temperature become elevated, to such an extent as to indicate severe constitutional disturbance, and there is a hope of delivery being effected, no alarm need be felt; but when it becomes evident from the pulsations increasing to one hundred or one hundred and twenty per minute, the breaking out of cold sweats on various parts of the body, and great swelling of the vulva and vaginal passage, that the vital powers are flagging rapidly, and that the fœtus cannot be delivered in the ordinary way, the most merciful treatment is to kill the animal; if the Cæsarian section be made at once, the young animal may be preserved alive.

Hæmorrhage.—Immediately after the birth of the young animal there may be considerable hæmorrhage from the umbilical opening. The treatment consists of applying a clean, antiseptic ligature around the cord, about one inch from the umbilical opening.

RETENTION OF THE PLACENTA

As previously stated, retention of the placenta beyond a reasonable length of time is of very rare occurrence in the mare, being of far greater frequency amongst cows. The best evidence of its presence within the uterus, and a symptom that is nearly always present in such cases, is that a portion of it hangs from the vulva. In cases where this symptom is not presented, the presence, or absence, of the placenta within the uterine cavity may be ascertained by a manual exploration of the uterus. In the cow it should never be removed immediately after birth of the young animal, as serious results may follow, and by waiting twenty-four hours, it may come away of its own accord. Savin, laurel, small doses of salts, have all been recommended to be administered internally for the removal of the placenta, but their efficacy is, to say the least, doubtful. In cases where decomposition of the placental membrane sets in, its removal must be effected without delay. The hand and arm should be well lubricated with carbolized oil, and then gently passed into the uterus, the cotyledon attachments found and gently broken down, after which the placenta may be easily removed. Injections of carbolized water into the uterus may be freely given both before and after removal of the membrane. If given before inserting the hand and arm, danger to the practitioner of blood-poisoning will thereby be greatly lessened; and similar injections given after the placenta has been removed, in conjunction with the administration of sodium hyposulphite, will often prevent septicæmia; a result almost certain to occur in all cases in which the placenta has been retained for a great length of time.

INVERSION OF THE UTERUS

This is usually a result of difficult parturition, and of violent straining and expulsive efforts on the part of the animal. Inversion of the uterus is most frequently observed to occur amongst cows, and may take place at any time up to twenty-four hours after parturition. The condition is rarely observed in other than debilitated animals.

Symptoms.—In cases where the uterus is only partially inverted, the animal may remain in a standing position; but in cases of complete inversion of the uterus, the animal almost invariably lies down, and remains in that position, while the inverted organ may be seen as a large swollen mass protruding from the vagina. When the animal is lying down, the uterus soon becomes dirty, and in many cases inflamed to a greater or less degree.

Treatment.—The patient should be forced to rise. The hind-quarters should be elevated, and the uterus supported by means of a sheet held by two or more assistants. The protruding viscus should now be nicely bathed, and thoroughly cleansed, with warm antiseptic solution. If swollen or inflamed, slight scarifications will be of considerable benefit. Care should, however, be exercised not to make the incisions too deep. A small quantity of tincture of opium, added to the water in which the uterus is bathed, is often of benefit. In case the fœtal membranes are attached to the inverted uterus, they should of course be gently removed. After having cleansed the organ, it should be returned to its proper place. This is a matter of considerable difficulty, especially in cases where it is completely inverted. Its return should be effected as gently as possible. After returning the uterus, the practitioner should insert his hand, and smooth it out in its proper position. It is in many cases a very difficult matter to retain it in position until it contracts, and to effect this object the hind-quarters of the patient should be kept elevated for a few days, and perfect quietude enforced. Straining may be prevented or greatly lessened by the judicious administration of opiates. Any pain that may be present may also be controlled in the same manner. Injections of antiseptics into the cavity of the uterus will be found of benefit. In some cases it becomes necessary to use a pessary to keep the uterus in place after returning it. An ordinary wooden potato-masher, covered with chamois skin, answers the purpose very well. A strong, large-sized glass bottle also makes a very good pessary. It should have a suitable piece of wood introduced into its mouth to keep it in position. An indiarubber-bag first introduced into the parts and afterwards inflated is one of the best appliances possible to use, as it can be inflated with air until it attains any required size. In case the rubber-bag cannot be obtained, an inflated bladder will answer the purpose almost as well. Trusses of various kinds, and more or less complicated, are also used, and some of them are very useful. Sutures, skewers, and clamps* are also sometimes employed to close the lips of the vulva. The desired object can often be effected by a strong person holding the hand in the uterus for half an hour or so, and antagonizing by gentle pressure any straining that may be indulged in by the animal. In case the uterus has remained inverted for a sufficient length of time to become gangrenous, a result very likely to occur in cold weather, or in warm weather if the circulation of the organ be interfered with, the practitioner must remove it. It may be removed by means of the knife, and the bloodvessels secured in the ordinary way; or its removal may be effected by means of

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[*] West, of Redhill, has invented a most useful clamp for this purpose.

the ecraseur. In some cases death almost immediately follows the operation, occurring in consequence of nervous collapse. This operation is not at all likely to be successful in the mare, but is performed with greater success on the cow, and is attended with very little danger indeed when performed on the smaller animals. As after-treatment, perfect quietude of the patient should be enforced, nourishing food should be allowed, stimulants administered, etc.

PARTURIENT FEVER

This disorder is more commonly known by the name of milk-fever. Most cases of parturition are characterized by a greater or less febrile disturbance, elevation of temperature, and the various indications of fever, which, occurring about the time of parturition, has received the name of parturient fever, and may occur in all animals, but is most frequently observed affecting cows.

Symptoms.—The animal shows more or less dulness. Fever is present, as is evidenced by the state of the pulse, and may exist in a very mild or a very severe form. The udder becomes hot, and in some cases severely inflamed, and no milk is secreted. The pulsations increase in rapidity; the appetite may or may not be affected, but in nearly all cases there is increased thirst.

Treatment.—A saline laxative, or purgative, may be administered if the patient be a cow. In the case of a mare, cathartics need not be given. Fomentations of hot water should be freely applied to the udder, and the patient frequently milked. Febrifuges and diuretics will exert a beneficicial effect, and food of a laxative character should be given.

PARTURIENT PERITONITIS

This dangerous condition may be induced by difficult parturition, or very rough usage during parturition. Long drives either before or after parturition, exposure to cold and wet weather, etc., are likely to be followed by an attack.

Symptoms.—The disease most commonly occurs subsequent to the act of parturition, the patient first showing slight dulness, followed shortly by more or less uneasiness, which increases as the disease progresses. The pulsations increase, become quickened, and shorter than usual; the patient lies down, and is unable to rise; the bowels are constipated; the urine scant in quantity and high in colour; the animal very often groans heavily, and gives other indications of suffering pain of a very severe character. In a majority of cases there is a reddish brown fluid discharged from the vagina. It is a very fatal disease, and in nearly all cases where extensive inflammation is present, death is the result. A post-mortem examination reveals a greater or less amount of exudation into the peritoneal cavity.

Treatment.—The patient should be placed in a comfortable, well-ventilated place, and given a good bed. She should also be kept as quiet as possible. A mild laxative may be administered as soon as the character of the malady is ascertained. A strong purgative should, however, never be given, as it would only serve to aggravate the trouble. Enemas of warm water may be freely employed, and the vagina and uterus may also be injected with warm water. Sedatives and opiates will be found to be of the greatest service; hence opium in some of its forms should be given in small and repeated doses to allay pain and control irritability. As a heart sedative, aconite stands pre-eminent, the tincture being the most preferable form in which to administer it. It should be given in repeated doses of medium size until the pulse indicates that a sufficient quantity has been administered. Cold water to drink should be allowed frequently, but in small quantities at a time. An oleaginous draught as a laxative is preferable to any other. It is essential that the body of the patient be kept warm, an object that may be effected by means of clothing. If recovery takes place, the animal should be fed for awhile on nutritious food and given tonics during convalescence.

PARTURIENT APOPLEXY (MILK FEVER)

This disease consists of a congested state of the brain and spinal cord. As a rule it attacks the cow when she is in her most vigorous milking condition, usually when she is more than three years of age, and is in every case dependent upon the act of parturition. It is asserted that there is not a case on record of the disease occurring in a primapara. The disease may be said to be almost peculiar to the cow, being very rarely observed in any of the other domesticated animals. It usually attacks the cow after the birth of her second or third calf, most frequently the latter. Very deep milkers are the most frequent sufferers. It is one of the most serious and rapidly fatal diseases with which the veterinarian has to deal. High feeding and a plethoric condition of the animal immediately preceding the act of parturition are undoubtedly powerful predisposing causes. Lack of exercise also exerts a certai amount of influence in the production of parturient apoplexy. It invariably follows an easy parturition, and th large amount of blood which after expulsion of the fœtu should go to make milk, instead of doing so, is thrown bac upon the system, and causing congestion of the brain and spinal cord, gives rise to the various symptoms of parturient apoplexy. In the State of Kentucky, U.S.A., where the grasses are fine, rich, and succulent, cows frequently suffer from parturient apoplexy while at pasture and receiving no other food. The disease is very rarely, if ever, observed to occur in a debilitated or badly-fed cow; and it is said that it never follows abortion. Sometimes the disease occurs just before parturition, but such cases are extremely rare. It usually follows the act of parturition, and is characterized by the extreme rapidity with which it is developed. When improvement begins in such cases as terminate in recovery, it proceeds with a rapidity almost equal to that noticed in the development of the disease. The second attack is usually fatal.

Symptoms.—Various symptoms may be noticed during the initial stage of the disease. Sometimes the first symptom to attract attention is a decrease in the flow of the milk, but as a rule the symptoms first noticed are dulness, hanging of the head, and a disinclination to move about. As the condition develops, food and water on being offered are refused, and the patient shows a slight uneasiness, resting first upon one set of limbs, then changing to another set. Soon rumination ceases, and the animal becomes oblivious to her surroundings, even ceasing to pay the slightest attention to her calf. On attempting to walk, it may be observed that she moves along with a paddling, unsteady gait; the respirations become hurried, but the pulse is, at first, not much affected; the bases of the horns, and the poll, are found to be warmer than natural, and in a majority of cases the surface temperature undergoes more or less reduction. As the disease progresses the pulse becomes affected, and the other symptoms above described become better marked. The urine, if passed, is very scanty, and is heightened in colour. The bowels become constipated, and the fæces, if any are passed, occur in the shape of extremely hard pellets covered with mucus. The patient soon falls heavily to the ground, and may become excited, try to rise, and knock her head about for a while, but quickly becomes comatose. She turns her head to one side, often allowing the nose to rest upon the ground, and appears to be in a deep sleep. The eyes become amaurotic, the corneæ have a wrinkled appearance, and are devoid of sensibility. On pulling the head of the cow round from her side and freeing it from restraint, it is immediately returned to its former position. This is a symptom that may be regarded as diagnostic. The patient occasionally changes her position, sometimes being stretched out at full length as though dead. The breathing is often scarcely perceptible, at other times it is of a stertorous character. When the symptoms become well marked, the urine and fæces cease to be passed, and an examination of the bladder often shows it to be full to overflowing. As a rule tympanites makes its appearance at some stage of the disease. The disease may make its appearance within an hour or two after parturition, but usually appears about the second or third day, rarely occurring later than the tenth day after parturition. The earlie it appears the likelier it is to be fatal, and a case beginning with great severity may recover, while a case beginnin mildly may terminate fatally.

Treatment.—During the past few years the treatment o milk fever in cattle has become so much changed for th better that the disease, instead of being considered one o the most fatal to which milch cows are liable, can now b treated with a large proportion of successful issues if on it is taken in time. The old treatment used to consist copious blood-letting if the patient was seen before she f down, together with a large dose of cathartic medicin

Some practitioners relied solely on stimulants, whisky and ammonia for preference, and in addition applied mustard or turpentine to the spine. Others advised covering the body with wet sheets, dry rugs being put over these. But in all cases the prognosis was most unfavourable. A vast improvement in the results attained came from the use of chloral hydrate, first introduced by McConnell of Wigton. An ounce was given as soon as possible, followed by half an ounce two hours later, and then every four hours until consciousness returned. In some districts it was found that the addition of an equal amount of potassium bromide was beneficial, in other districts the chloral alone was used. Now, thanks to the researches of Schmidt of Kolding, an entirely new idea has been adopted, and the affection is attacked through the mammary gland itself. Schmidt advised the injection, by means of a small rubber syringe and teat syphon, of a sterilised solution of potassium iodide as soon as possible. Two drachms dissolved in a pint of carefully sterilised (by boiling) water is divided between the four teats and slowly injected twice a day. Chinosol (grs. x.—xx.) dissolved in the same way is also successful. The results have been, in many cases, little short of marvellous, the cow often getting up after the first or second injection. Occasionally mammitis has ensued as a sequel, and on account of this the sterilisation of the injection fluid is particularly necessary. In any case, whatever treatment is adopted, the greatest care must be paid to the general comfort and hygiene. The urine must be frequently removed by the catheter if necessary, and the bowels relieved by enemas. As regards the free removal of the milk, opinions here are at variance, but most practitioners agree in removing a certain amount at frequent intervals. The patient should be kept propped up on her sternum, with the head elevated above the rest of the body; and her position should be changed every hour or so. Great care should be exercised in the administration of medicines by the mouth, as when the animal is in a comatose condition any draught that may be administered will be likely to enter the trachea and cause death. Hence the stomach-pump should be used to give draughts, or the medicine should be given in other ways. If tympanites puts in an appearance, the trocar and cannula may be used to relieve the condition, and a suitable draught given to prevent its recurrence. A cow, after having suffered once from parturient apoplexy, becomes more susceptible to the disease than one that has never had an attack.

PARTURIENT PARALYSIS

Paralysis occasionally follows parturition, usually making its appearance within two or three days after the birth the young animal, and sometimes becomes a very seriou condition.

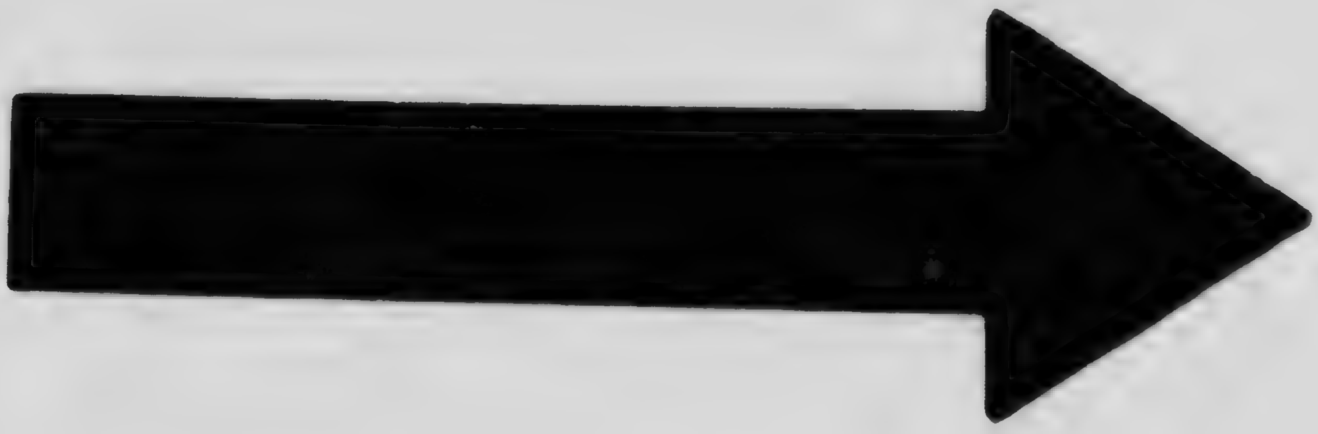
Symptoms. — The patient on being made to walk i observed to be unsteady in gait, perhaps staggers fron side to side, and has what is known as a paddling gait. Thi symptom is well marked; soon the animal, no longer abl to stand, falls, loss of motor power becoming better marke than ever. The patient, when down, is unable to rise, bu pain does not seem to be an accompanying symptom, an the secretion of milk does not seem to be much, if at al affected.

Treatment.—A strong diffusible stimulant should be give as often as may be deemed necessary in the judgment the practitioner. Hot-water and stimulating linimen should be applied over the course of the spinal column. very nice mode of counter-irritation is to place a blanket thin cloth upon the back and pass a hot smoothing-iron over it. In all such cases the prognosis should be favourable, although it may be a couple of weeks before the patient can be got upon her feet. Nux vomica, in the usual-sized doses and at proper intervals, is the most important of all the remedial agents employed in the treatment of this condition. If preferred, subcutaneous injections of strychnia may be given in place of the nux vomica. It may be necessary to remove the urine once or twice daily; and it should be seen that the bowels are kept in proper condition. The nux vomica, or strychnia, should be continued so long as weakness or any sign of paralysis remains, such as knuckling of the fetlocks, staggering, etc. Where the condition persists for an unusual length of time, electricity may be used upon the parts with advantage. Frequent and long-continued hand-rubbing will also be of benefit, and in some cases a good vesicant or the actual cautery applied over the course of the spinal column acts with wonderful efficacy. The position of the patient should be frequently changed, in consequence of which she will rest better and not be so likely to have sores. The food and water should be of the best quality procurable.

MAMMITIS

Mammitis consists of inflammation of the mammary gland; it is also known by the more common name of 'garget.' Mammitis occurs in two forms: in one form being confined to the superficial structures of the gland—this is the mildest; in the other form the interior of the gland is affected. Any one, or more, of the quarters may be affected, and occasionally the whole of the gland may be involved in the inflammatory process.

Causes.—There are a great many causes which operate in



MICROCOPY RESOLUTION TEST CHART

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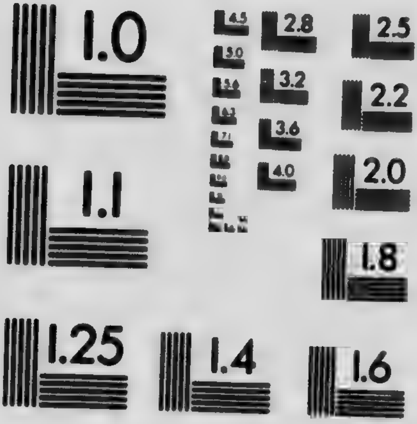

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the production of mammitis. Amongst these may be mentioned exposure to extreme cold, sudden alternations of temperature, such as very hot days followed by cold nights, injuries of any kind, as kicks, wounds from briars, stings of insects, the udder coming into contact with poisonous plants, etc. Indigestion may also cause it and irregular milking is a prolific cause of the condition in city cows. Neglecting to completely empty the udder at each milking has tendency to cause an attack. Over-stocking will also caus it, especially in those cases where the cow is driven a lon distance whilst suffering from an over-distended udder.

Symptoms.—Often the first symptom observed is sligh lameness of the animal; and if the inflammation is con fined to one quarter, or one half of the gland on one side the lameness may be observed to be in connection with th hind limb of the same side. In the case of the two posterio quarters, or the whole, of the gland being inflamed, th animal may exhibit lameness or stiffness in both hind limb Lameness, however, is not always present, but there i generally more or less stiffness of gait and a straddling actio of the hind-legs, which increases as the inflammation an swelling of the mammary gland increase. The secretio of milk becomes more or less impaired, according to th intensity of the inflammation. The respiration is more less disturbed, being accelerated and shorter than norma the muzzle becomes dry and hot, and all the indications fever are presented. The udder, on being examined, is foun to be considerably swollen, hard in the affected portion and very hot and tender, the patient, as a rule, strong objecting to have it touched. The appetite is more or le irregular, in some cases being almost wholly suspended, b increased thirst is evinced by the patient. The bowels a usually constipated, and the urine is passed in lessen quantities and is heightened in colour. Any milk that m be drawn away at this time contains lumps or clots, and may be mixed with blood, or even pus, and possess a fœtid odour. At this stage of the disease total destruction of the affected portions of the gland may be expected to take place, and even death of the patient sometimes occurs. In cases terminating favourably, a full flow of milk cannot be expected from the gland until the animal has her next calf.

Treatment. — The treatment should be prompt and energetic, as the longer the case is neglected, the more difficult it becomes to effect a cure. The treatment embraces the employment of both local and constitutional remedies. A purgative should at once be given, and a suspensory bandage should be used to support the weight of the gland. The application of a suspensory bandage is one of the most important requisites in the treatment of mammitis. The bandage, being placed in position, may have a quantity of bran or spent hops placed in it and around the udder, and the bran or hops should be kept constantly moist by pouring upon them hot water, care being exercised not to scald the patient. If rigors are observed, a good diffusible stimulant should be administered, and the patient kept warmly clothed. As much milk as possible should be drawn off from the inflamed gland, to effect which object the patient may be milked as many as a dozen or more times daily. The lumps or clots may be broken up by gentle manipulation, and forced out of the gland. If the milk will run, a milk syphon may be inserted in each teat, secured in place and allowed to remain as long as benefit is obtained. In case suppuration takes place, the parts must be opened to allow the pus to escape freely. Belladonna paste is a very useful application to the gland, as it relieves pain. If suppuration occurs, it may be necessary to open the teat only. Suppuration does not completely destroy the function of the part. If the udde becomes indurated, compound iodine ointment will b found useful. If gangrene occurs, remove the gangrenou portions and treat the parts antiseptically.

Stricture of the Teat.—Stricture of the teat is a ver common condition, and may result from exposure to cold or injury. Almost any of the causes of mammitis wi produce it. It is often seen in the cow after calving, an causes the milk to flow in a small stream, by means c which symptom its presence may be known. A wa situated within the teat will give rise to the same sympton The stricture is usually situated in the upper portion of th teat.

Treatment.—The treatment consists in dividing th stricture—the best instrument for the purpose being th concealed bistoury. Too large an incision should not b made. After division of the stricture, the cow should b milked three or four times a day to prevent the par adhering. In case they do adhere, they must be agai divided in the same way as at first.

Warts.—Warts occur both on the outside and the insic of the teats, and are of the same character as when occu ring in any other part of the body. If a wart be situate on the outside of the teat, a few applications of calamir ointment will usually be sufficient to effect its removal. it be situated on the inside of the teat, the conceal bistoury may be used to cut it away. Calculi, or conc tions known as milk stones, are also found occasionally the duct of the teat, and cause more or less obstruction the flow of milk. Their presence in the teat can be readi detected, and they can usually be removed by gentle ma pulation, etc.

Excoriation of the Teats.—The teats are frequen excoriated, by coming into contact with long damp gra exposure to cold, etc., and such a condition may lead on to mammitis.

Treatment.—The teat should be handled very carefully when milking the animal, and soothing and astringent ointments should be used; and sometimes it may become necessary to remove a teat. Occasionally a large swelling, partly of an inflammatory character, may be observed, situated near the upper part of the udder. The practitioner should be very careful as to the course of treatment, as the enlargement may be due to the presence of hernia—a condition occurring very easily in this region, as here the abdominal walls are very thin. The cow should be cast and secured, after which the parts may be opened very carefully, and explored with a probe, as the enlargement may be due to the presence of an abscess, or an abscess coexisting with hernia. In either case give such treatment as the condition seems to demand.

CHAPTER XXVIII

AZOTURIA

AZOTURIA belongs to the class of dietetic diseases, and may be defined to be a hyper-nitrogenous condition of the blood and system generally. The disease is characterized by partial or complete loss of motor power in the hind-quarters, and has often been mistaken for a renal affection. Percivall termed it 'albuminuria.' It is also known as 'enzoötic hæmaturia,' 'hysteria,' etc., and by the Germans has been termed 'hæmaglobinuria.' The nature of the disease has given rise to a great deal of discussion, and it has never been quite decided what name would be the most suitable for it; but 'azoturia' is pretty

generally accepted, and perhaps is the name in mo
common use.

Causes.—The disease is caused by an excess of albume
For instance, a horse is worked regularly and receives
large supply of good food, when from some cause he
allowed to stand for several days idle in the stable, bu
still receives the usual quantity of rich and stimulating foo
as a result of which the system becomes loaded wit
albumen; large quantities of urea and hippuric acid a
formed, secreted by the liver, and retained within th
system in consequence of the kidneys acting in an improp
manner, and the nervous system becomes affected by th
urea. The animal is now taken out and exercised. Th
slightest exercise will be sufficient to develop the troubl
more particularly if it be rapid. The albumen, which
present in excessive quantities in the blood, now undergo
rapid oxidation, and exerts a peculiar effect upon certa
muscles, causing tonic contraction, more particularly of th
large muscles of the loins and quarters. The disease ma
occur during any season, but in Canada is most comm
during the winter months, in consequence of, as frequent
occurs, a horse being hardly ridden, then kept in t
stable for a day or two, and highly fed in the meantim
after which he is taken out, exercised, and the disea
developed. As a rule, a rest of forty-eight hours is
quired to produce the peculiar condition of the system p
disposing to an attack, and which, being present, requi
only exercise for its development. The disease is by
means uncommon amongst road horses. Prof. Smith say
'I am inclined to think that albumen may be found
largely excessive quantities in the urine of horses sufferi
from azoturia, and Drs. Barrett and Ellis coincide with
in this view, Prof. Williams entertaining a contrary opini
I had some urine drawn from a horse suffering from t

disease, analyzed by Prof. Ellis, of the School of Practical Science and Chemistry. The analysis showed the presence of albumen in the urine in largely excessive quantities; still, the point is a disputed one.' Quick or violent exercise is more likely to induce, or rather develop, the condition than slow work. The urea acting upon the nerves causes tonic spasm of certain muscles, and oftenest those of the hind extremities. The disease is frequently associated with bowel disorders, more particularly in cases developed by rapid exercise when the stomach and bowels are overloaded with ingesta.

Symptoms.—The symptoms of azoturia are very plain, and should be readily recognised by anyone who has even the slightest acquaintance with the disease. The horse is brought out of the stable after having been well fed and rested for several days. He comes out in high spirits, and apparently full of life. After travelling a short distance he is observed to become somewhat dull and sluggish, perspires freely, and then shows stiffness in the loins, exhibiting an action somewhat similar to that caused by placing the foot upon a stone. The animal during progression drags the limb along, as it were, may stagger slightly, manifests weakness in the region of the loins, and finally stops, being unable to proceed any further on his way; he may retain the standing posture or may fall, or lie, down. When down he is unable to rise, the pulse quickens, and more or less pain is manifested. In the early stage of the disease, if allowed to stop, he will do so, lying down and rolling frequently, as though suffering from colic, until finally on lying down he becomes unable to rise; the muscles of the haunch become firmly contracted, and feel as hard as though composed of steel. Azoturia occasionally manifests itself in connection with the fore extremities instead of the hind limbs; in this form it is not so severe as when affecting the hind-quarters. Wl the psoas muscles are involved the animal suffers pain an excruciating character; in some cases the sympto presented might lead one to think the animal had sustai an injury of a mechanical character. The history of case, and the symptoms brought to light by a clo examination, will, however, reveal the true character the malady — the pulse is usually, but not alwa quickened; the respirations increase in number, temperature becomes elevated, and the bowels are fou to be loaded.

Treatment.—Whatever treatment is employed should commenced as early as possible. If the pulse is full bounding, immediate relief may usually be afforded b copious abstraction of blood. In place of venesection go sized doses of aconite may be administered with benefit the pulse is weak or faltering, a good diffusible stimul should be administered, probably the best, in a case azoturia, being nitrous ether, which may be given in ordinary-sized doses. The body should be well cloth especially over the region of the loins, and every me adopted to induce a copious flow of perspiration. Coun irritants should be freely used over the region of affected muscles, and the ordinary camphorated linim may be productive of benefit if applied with smart fricti water as hot as the patient can bear it may also be app to the parts. A newly-flayed sheep-skin forms an excell counter-irritant; mustard is, however, most commo used, and is very good applied in the form of a paste plaster. The intestinal canal should be unloaded as quic as possible, to effect which object enemas of warm wa may be freely employed: a full dose of cathartic medic should also be administered. The urine is usually retai in the bladder, necessitating the use of the catheter for removal. It is of a dark-brown colour, similar to coffee in appearance, undoubtedly containing urea in excess, and in all probability contains largely excessive quantities of albumen, and is secreted in less than the usual quantities. Potassium bromide has recently been strongly recommended by some Continental authorities with very marked success and excellent results. It should be given in full and oft-repeated doses. In cases where pain is severe, opium may be given, but its administration, to an animal suffering from azoturia, should be guarded. Digitalis has been tried, and recovery has followed its use. If the approach of the disorder is noticed in time, it may be arrested in its course and total recovery of the animal take place in the course of two or three days. In some cases there may occur, as complications, slight tympanites, spasm of the diaphragm, etc., which render the case more alarming. If the patient is able, and can be induced, to retain the standing posture, great benefit will accrue therefrom, inasmuch as it is in this position only that the acts of defecation and micturition can be performed properly, and without difficulty. In some severe cases the patient may be placed in slings. After recovery the animal should be used carefully for some time, as there will be a tendency to suffer again; the malady in its acute form sometimes lasts for six weeks. During convalescence good food should be allowed, and tonics administered.

CHAPTER XXIX

Cardiac Diseases

PERICARDITIS

PERICARDITIS, or inflammation of the pericardium, occurs all animals, but is most frequently met with amongst catt It may be caused by injury, and in such cases is describ as traumatic pericarditis; or it may arise from ordin causes. Cattle suffer more frequently because they swall all kinds of foreign bodies. Pericarditis often occurs a complication of rheumatism, influenza, pleurisy, and ot debilitating diseases Rheumatism is a common cause the disease in the human family. It is often caused b needle, a nail, piece of wire, or other sharp foreign bo After inflammation of the pericardium, a certain amo of effusion takes place into the pericardial sac, constitut a condition known as hydrops pericardii, or dropsy of pericardium. There is also a great tendency to the for tion of false membranes on the pericardium, and they h been found in some cases half an inch in thickness.

Symptoms.—The pulse is hard and irritable, is ea excited by the slightest movement, and is sometim intermittent character. The respirations are irregular, on the whole are quickened. The symptoms may easily be mistaken for those of pleurisy; and, as be stated, pleurisy may coexist with pericarditis. The of the patient appear unnaturally bright; auscult reveals, usually, an increase in the number of heart-b as well as a change in their character; the mouth is ho than usual; the ears and legs are alternately hot and and all the general indications of pyrexia are present; bowels and appetite are irregular, and when hyd pericardii results, a lingering death is the only termination that can be expected. A post-mortem examination reveals a copious effusion of serum into the pericardial sac, and in many cases false membranes to such an extent that the pericardium can scarcely be seen.

Treatment.—Small and repeated doses of aconite appear to have a highly beneficial effect, allaying pain and irritability. Pain may, however, if excessive, be more effectually controlled by the administration of opium in some of its forms. Potassæ Bicarb., in doses of ʒii., may be given every four hours until relief is afforded. The patient should be kept perfectly quiet and out of the way of any sight or sound likely to cause excitement. Digitalis is recommended by some practitioners to be given in combination with nitrate of potash. Fomentations to the sides, or even a strong vesicant, frequently are attended with beneficial results. Oleaginous draughts may be given as often as may be necessary, to keep the bowels in good condition. In the course of time the case will terminate fatally in spite of all that can be done—treatment only serving to prolong the life of the animal. The internal administration of iodide of potash may be tried with a view of causing absorption of the fluid effused, but generally its use is not attended with much benefit. In a case where a horse has been suffering from influenza or any other debilitating disease, and has reached the convalescent stage, it may sometimes be noticed that suddenly his respirations change in character, the breathing becoming quicker than usual, œdematous swellings of the limbs appear, and regurgitation of blood may be observed to be taking place in the jugular veins. With such symptoms the practitioner may suspect that effusion has taken place into the pericardial sac. In such a case digitalis may be of service. The judicious use of stimulants will also be productive of great benefit. The food must be of the b quality procurable, light, highly nutritious, and of a ki readily digestible. Iodide of potassium, as above-mention may be tried. This treatment failing, recourse must had to the operation of paracentesis: a small trocar a cannula being introduced at the side of the sternum betw the fifth and sixth ribs. This operation has been perform with success, but it is one that, on account of the extre danger attending its performance, is not to be reco mended, and should never be performed except in ca where the only choice is between the death of the ani and paracentesis. After the performance of the operati the patient should be placed in a very quiet, well-ventila and slightly darkened place, and not allowed to move abo to any great extent, for several days. The food, water, attendance should be of the very best. The patient sho not be allowed to see or hear anything likely to cause slightest excitement. He should also, immediately a the operation, be put upon a course of potassium iodide prevent further effusion.

Endocarditis.—This condition consists of inflamma of the endocardium, or lining membrane of the heart. is a very serious affection, and one very hard to disting from pericarditis, the symptoms being about the sam both conditions. Very little, besides keeping the pat perfectly quiet, can be done in the way of treatment.

CARDITIS

Carditis, or inflammation of the heart substance, oc in connection with pericarditis and endocarditis. In where the whole, or a large portion, of the heart subst is inflamed death quickly occurs. If the inflammatio circumscribed in character, recovery may take place there is a tendency to the formation of small abscesses. The treatment is the same as that laid down for pericarditis, but is not often successful.

HYPERTROPHY OF THE HEART

Simple hypertrophy is a condition in which the walls of the heart become thickened, and the cavities enlarged. This form is common in race-horses and stallions, as well as among those members of the human family who follow athletic sports or do violent work. 'Concentric hypertrophy' is that form of hypertrophy in which the walls of the heart become thickened, and the cavities lessened in size. Anything that tends to obstruct the flow of blood through the heart has a tendency to produce hypertrophy of that organ. It is frequently associated with valvular disease of the heart.

Symptoms.—The animal shows general weakness. The pulse may either be strong and hard, or weak and quick, depending upon the form of hypertrophy that may be present. Venous regurgitation may also be noticed taking place in the jugulars, and the animal may have frequent fainting fits.

Treatment.—Medicinal treatment is not satisfactory. The animal must not be put to violent work.

Heart, Dilatation of. Dilatation of the heart is most common amongst pampered and irregularly exercised animals, and more especially when such are highly fed. The symptoms are those usual to heart disease, such as an irregular pulse and regurgitation of blood in the jugular vein. The animal may die very suddenly, although many cases live and do light slow work for a long time. The patient should be well fed on nutritious food, and kept away from all violent work.

Rupture of the Heart.—Rupture of the heart is the common termination of dilatation, and is most likely to occur whilst the animal is undergoing some violent exertion, as racing, etc. Death immediately results.

Heart, Valvular Disease of.—Valvular disease of the heart may occur as a result of fatty degeneration of the organ, and from warty growths, etc., on the valves. This last cause is one operating most commonly among cattle. Nothing can be done.

Venous Regurgitation. — When venous regurgitation exists auscultation reveals a peculiar cooing sound, and the heart beats over a considerable surface. If the patient is excited the pulse runs up very quickly, and is of an intermittent character. This condition is often noticed in the convalescent stages of influenza. It is symptomatic of heart disease; but if the pulse is full, it may be regarded as a good sign, showing that the heart is regaining its tone.

Cyanosis.—Cyanosis, or, as it is often called, 'blue disease,' when constant, may be due to malformation of the heart. The foramen ovale remains open instead of closing at birth. Any abnormal opening existing in the auricular or ventricular septa will give rise to the same symptoms. It causes death, but usually only after a long time.

Symptoms. — The symptoms are not so well marked among the lower animals as in man, on account of the difference in the colour of skin. In man there is a peculiar blueness of the lips, face, etc.; the lips looking as though stained while eating blue berries. The same symptoms occur in the lower animals; but, as before stated, are not so well marked. They are better marked in white haired and white skinned animals.

Aneurisms.—An aneurism is a tumour produced by dilatation of an artery; when all the coats of the artery are dilated and form a pouch, it is known as a 'true aneurism.' Rupture of the inner coat, whilst the two outer coats of the artery remain uninjured, constitutes a 'false aneurism.' When the outer coats of the artery rupture, and the inner coat remains intact, the condition is known as 'hernial aneurism.' A 'consecutive' aneurism is where the inner coat gives way first, after which the middle and outer coats give way in the order named. A 'dissecting' aneurism is one in which the separation of two of the coats of the artery takes place; the blood flows between the separated coats and causes further separation, gradually dissecting one coat from the other. Aneurisms are most frequently seen in connection with the mesenteric arteries. An aneurism may exist in connection with the carotid artery for a long time, but sooner or later the affected coats rupture and death results.

Treatment.—When the aneurism is in such a situation that it can be got at, it should be cut down upon, the artery ligated, and the aneurism dissected out.

Heart, Foreign Bodies in.—Foreign bodies are not unfrequently found in the heart of the ox. The substance is first taken into the reticulum, which by its action forces it through the diaphragm, and it proceeds on its journey until it penetrates the pericardium and becomes lodged in the heart.

Symptoms.—The animal shows the general symptoms of severe heart disease. The appetite is irregular, there is extensive œdema of the limbs and under the sternum. In some cases this will pass off for a time and the animal apparently recover, but in most instances the symptoms reoccur. With such symptoms the practitioner may feel pretty safe in diagnosing the case as one of some foreign substance imbedded in the heart. Various objects, as knives, needles, and wire,* have been found in the hearts of cattle. Nothing whatever in the way of treatment can be done, with any reasonable hope of relieving the condition, the only possible termination for such a case being death.

Embolism, Thrombus.—A small piece of diseased endocardium may become detached and carried along by the circulation; the blood clots around it until it attains a considerable size and obstructs the circulation. It is mos frequently noticed in connection with the femoral artery and may be the starting-point of an aneurism. When i the femoral artery the symptoms are very peculiar; th lameness is sudden and severe, the patient manifests ver great pain, and the limb on being handled is found t be deathly cold. The pain may be so intense as to caus perspiration to break out in patches over the animal' body. He may suddenly recover, and appear all right i a few minutes, but is liable to another attack at any tim An examination per rectum will very much assist th practitioner in arriving at a correct diagnosis. If th arrest of the circulation is complete, most agonizing pai is suffered by the patient, and death may take place ver quickly.

Treatment.—The treatment consists of applying warmt to the affected limb. Hence fomentations should be freel applied to the limb; the water being as hot as it can applied without scalding the parts. Hot liniments ar stimulating applications of various kinds may also applied, and should be applied with smart friction. the above treatment fails to give relief, and the lin remains cold, the practitioner may rest assured that t circulation of blood through the part is obstructed. Aconi may be given to reduce the heart's action, and opium to relieve pain. On making a post-mortem examination, extensive suppuration may be revealed in connection with the part.

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* In coal-mining districts old pit-wire is largely used for fencin this rusts and breaks up, pieces being frequently picked up by t cattle when grazing.

CHAPTER XXX

BLACK-QUARTER

THIS disease, also known under the names of quarter-ill, black-leg, symptomatic anthrax, felon, murrain, puck, and various other terms in different districts, is mainly confined to young cattle and sheep. It has been observed occasionally in animals more than two years old, but principally affects those between six and eighteen months. It is usually fatal, although cases of recovery are not unknown. Generally the best of the herd are the ones which are attacked, and in some districts certain pastures are always looked upon as infected grounds.

Cause.—The cause is known to be a club-shaped, anærobic organism, the bacillus of black-quarter, and it is mainly owing to the researches of Professors Arloing and Kitt that we are indebted for the present knowledge of the subject. The infectiousness of diseased muscle tissue, which has been taken from an affected subject and dried, will remain for years.

Symptoms.—The onset is so sudden that it may be unobserved, the first intimation being that the owner will find one or more of the young cattle dead in the field. If anything is noticed it is usually in the form of sudden illness, with loss of appetite, dulness, high fever, and lameness in one leg. Closer examination reveals a swelling, at first hard, and afterwards crepitating, in the muscles of the neck or of the affected limb. This crepitating, crackling sound is produced by the presence of gas in the subcutaneous tissues and muscles, and is absolutely diagnostic. As the disease progresses the patient manifests signs of dull, wearying pain and is unable to stand, eventually becoming comatose.

Treatment.—Various remedies have been tried as curative means in the treatment of black-quarter, but no drug has yet been found which can be considered to be specific. Recoveries have been known to result when the affected part has been scarified deeply and freely, and caustics or strong disinfectants applied to the wounds thus made. Carbolic acid, corrosive sublimate, zinc chloride, and even common salt have been used in this way, the beast being restored to health (although often with a useless limb) afterwards. Nothing can, however, be relied upon, and an unfavourable prognosis should always be given.

In country districts the practice of setoning or rowelling is still resorted to, and believed in by many of the agricultural community. Either one or the other is inserted in the dewlap of the calf, the seton tape being passed from side to side (or down one side) subcutaneously. The tape is usually smeared with some irritant such as a preparation of cantharides or turpentine.

In rowelling a slit is cut, with a special pair of scissors, through the skin (which is separated from the tissues underneath it), and a piece of leather or some such foreign body, previously smeared with a preparation of hellebore, is inserted, or a piece of the root itself of the green hellebore is used. The faith in this method is not now what it used to be, and numerous instances have been recorded in which calves have died of black-quarter some weeks afterwards with the setons or rowels *in situ*.* Both treatments are utterly useless.

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* Stockman, *Journal of Comparative Pathology and Therapeutics*, vol. x., p. 233.

It is to rational prophylactic methods that the treatment must be directed. The survivors should be removed from the infected pasture at once, and the field itself utilised for some purpose other than the grazing of young animals, being drained if possible.

A protective system of vaccination has now been perfected, and the results are excellent. In districts where black-quarter is prevalent, all calves between six and eighteen months old should be done. As the immunity conferred lasts only for about twelve months, it is a wise precaution to re-vaccinate all the young animals in the subsequent year. Two vaccines are used, one vaccination following the other after an interval of about ten days.

Under antiseptic precautions, a dose of the vaccine is introduced under the skin of the under surface of the tail, or close to the shoulder, the former being preferred, as it is considered to be safer. It should not be done during very hot or very cold weather. Occasionally death has been traced to the vaccination, but such an event is rare, and the percentage of fatalities from black-quarter amongst vaccinated animals is practically nil. Professor McFadyean advises that, in order to facilitate the process, a gallery should first be made in the subcutaneous tissue of the tail with a trocar and cannula, the vaccine being introduced through the cannula.

Quite recently a single vaccination, by means of small dry vaccine pellets and a specially constructed syringe, has been introduced both in England and America, the advantages being that it is a very convenient form of administration, and only requires to be done once, there being no necessity to re-vaccinate in ten days' time as with Arloing's method.

SWINE FEVER

This disease is one which is highly contagious amongst pigs, being caused by a specific organism, the bacillus of swine fever, first described by Professor McFadyean in 1895.*

Symptoms.—These may run an acute course or, what is more common, the symptoms may extend over some considerable time before a fatal termination occurs. Recovery may result, but the percentage of fatalities is very high. At first the affected animal is noticed to be dull, and the appetite is irregular; the temperature is raised, and the respiration may become accelerated. The skin is covered with diffused reddish-purple patches, especially marked on the ears and along the under-surface of the flanks. The bowels are irregular, the fæces being usually a 'pea-soup' coloured diarrhœa and very fœtid. As the disease progresses great anæmia and emaciation ensue, there is a constant, husky cough, and the patient is very much prostrated.

The chief diagnostic post-mortem symptom is the presence of diphtheritic deposit button-like ulcerations on the mucous membrane of the intestine, especially around the ilio-cæcal valve.

Treatment.—No curative treatment is known, although a great deal of research work is now being done with a view to finding a protective serum. In most countries legislative measures are adopted, the owner of a suspicious case being compelled to report to the police. A veterinary inspector is then called in, and if the existence of the disease is confirmed the place becomes an infected area. In making a diagnosis care must be taken not to confound the discolouration of the skin and other symptoms produced in swine fever with those of brine poisoning. In certain stages there is some similarity.

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* *Journal of Comparative Pathology and Therapeutics*, vol. viii., p. 306.

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THE END.

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